Network05 综合项目

案例：综合网络搭建

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1.1 问题

现有网络问题分析：

接入层交换机只与同一个三层交换机相连，存在单点故障而影响网络通信。

互联网连接单一服务商

现有网络需求：

随着企业发展，为了保证网络的高可用性，需要使用很多的冗余技术。

保证局域网络不会因为线路故障而导致的网络故障。

保证客户端机器不会因为使用单一网关而出现的单点失败。

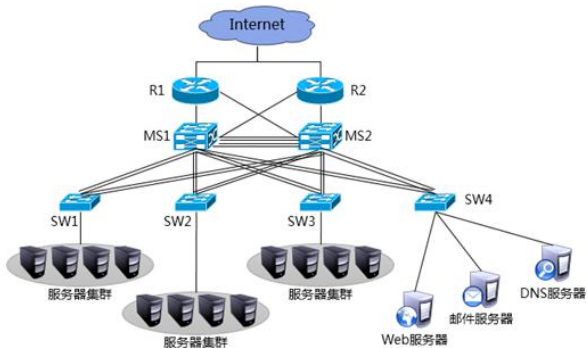保证到互联网的高可用接入使用冗余互联网连接。

提高网络链路带宽。

1.2 方案

基于项目的需求，需要用到如下技术：

STP：解决二层环路带来的广播风暴并链路冗余问题

链路聚合：提高网络链路带宽

OSPF 路由协议：实现网络路径的自动学习

VRRP：实现网关冗余

重新规划后的网络拓扑如图：

1.3 步骤

1.4 实现此案例需要按照如下步骤进行，为了配置过程中不被弹出信息干扰，可以关闭信息提示。

步骤一：S3700 交换机配置

SW1 配置

```
<Huawei>system-view

[Huawei]vlan batch 10 20 30 40

[Huawei]port-group 1

[Huawei-port-group-1]group-member Ethernet 0/0/1 to Ethernet 0/0/2

[Huawei-port-group-1]port link-type    trunk

[Huawei-port-group-1]port trunk allow-pass vlan all
```

[Huawei-port-group-1]quit

[Huawei]interface Ethernet 0/0/5

[Huawei-Ethernet0/0/5] port link-type access

[Huawei-Ethernet0/0/5] port default vlan 10

SW2 配置

<Huawei>system-view

[Huawei]vlan batch 10 20 30 40

[Huawei]port-group 1

[Huawei-port-group-1]group-member Ethernet 0/0/1 to Ethernet 0/0/2

[Huawei-port-group-1]port link-type   trunk

[Huawei-port-group-1]port trunk allow-pass vlan all

[Huawei-port-group-1]quit

[Huawei]interface Ethernet 0/0/5

[Huawei-Ethernet0/0/5] port link-type access

[Huawei-Ethernet0/0/5] port default vlan 20

SW3 配置

<Huawei>system-view

[Huawei]vlan batch 10 20 30 40

[Huawei]port-group 1

```
        [Huawei-port-group-1]group-member Ethernet 0/0/1 to Ethernet 0/0/2

        [Huawei-port-group-1]port link-type    trunk

        [Huawei-port-group-1]port trunk allow-pass vlan all

        [Huawei-port-group-1]quit


        [Huawei]interface Ethernet 0/0/5

        [Huawei-Ethernet0/0/5] port link-type access

        [Huawei-Ethernet0/0/5] port default vlan 30
```

SW4 配置

```
        <Huawei>system-view

        [Huawei]vlan batch 10 20 30 40

        [Huawei]port-group 1

        [Huawei-port-group-1]group-member Ethernet 0/0/1 to Ethernet 0/0/2

        [Huawei-port-group-1]port link-type    trunk

        [Huawei-port-group-1]port trunk allow-pass vlan all

        [Huawei-port-group-1]quit


        [Huawei]interface Ethernet 0/0/5

        [Huawei-Ethernet0/0/5] port link-type access

        [Huawei-Ethernet0/0/5] port default vlan 40
```

步骤二：S5700 交换机配置

MS1 配置

```
<Huawei>system-view

[Huawei]vlan batch 10 20 30 40 50 60

[Huawei]port-group 1

[Huawei-port-group-1]group-member GigabitEthernet 0/0/1 to GigabitEthernet 0/0/5

[Huawei-port-group-1]port link-type    trunk

[Huawei-port-group-1]port trunk allow-pass vlan all

[Huawei-port-group-1]quit


[Huawei]interface Vlanif 10

[Huawei-Vlanif10]ip address 192.168.10.252 24

[Huawei-Vlanif10]vrrp vrid 1 virtual-ip 192.168.10.254

[Huawei-Vlanif10]vrrp vrid 1 priority 110

[Huawei]interface Vlanif 20

[Huawei-Vlanif20]ip address 192.168.20.252 24

[Huawei-Vlanif20]vrrp vrid 2 virtual-ip 192.168.20.254

[Huawei-Vlanif20]vrrp vrid 2 priority 110


[Huawei]interface Vlanif 30
```

```
[Huawei-Vlanif30]ip address 192.168.30.252 24

[Huawei-Vlanif30]vrrp vrid 3 virtual-ip 192.168.30.254

[Huawei]interface Vlanif 40

[Huawei-Vlanif40]ip address 192.168.40.252 24

[Huawei-Vlanif40]vrrp vrid 4 virtual-ip 192.168.40.254


[Huawei]interface Vlanif 50

[Huawei-Vlanif50]ip address 192.168.50.2 24

[Huawei]interface GigabitEthernet 0/0/23

[Huawei-GigabitEthernet0/0/23]port link-type access

[Huawei-GigabitEthernet0/0/23]port default vlan 50


[Huawei]interface Vlanif 60

[Huawei-Vlanif60]ip address 192.168.60.2 24

[Huawei]interface GigabitEthernet 0/0/24

[Huawei-GigabitEthernet0/0/24]port link-type access

[Huawei-GigabitEthernet0/0/24]port default vlan 60


[Huawei]ospf

[Huawei-ospf-1]area 0
```

[Huawei-ospf-1-area-0.0.0.0]network 192.168.10.0 0.0.0.255

[Huawei-ospf-1-area-0.0.0.0]network 192.168.20.0 0.0.0.255

[Huawei-ospf-1-area-0.0.0.0]network 192.168.30.0 0.0.0.255

[Huawei-ospf-1-area-0.0.0.0]network 192.168.40.0 0.0.0.255

[Huawei-ospf-1-area-0.0.0.0]network 192.168.50.0 0.0.0.255

[Huawei-ospf-1-area-0.0.0.0]network 192.168.60.0 0.0.0.255

MS2 配置

<Huawei>system-view

[Huawei]vlan batch 10 20 30 40 70 80

[Huawei]port-group 1

[Huawei-port-group-1]group-member GigabitEthernet 0/0/1 to GigabitEthernet 0/0/5

[Huawei-port-group-1]port link-type   trunk

[Huawei-port-group-1]port trunk allow-pass vlan all

[Huawei-port-group-1]quit

[Huawei]interface Vlanif 10

[Huawei-Vlanif10]ip address 192.168.10.253 24

[Huawei-Vlanif10]vrrp vrid 1 virtual-ip 192.168.10.254

[Huawei]interface Vlanif 20

[Huawei-Vlanif20]ip address 192.168.20.253 24

[Huawei-Vlanif20]vrrp vrid 2 virtual-ip 192.168.20.254

[Huawei]interface Vlanif 30

[Huawei-Vlanif30]ip address 192.168.30.253 24

[Huawei-Vlanif30]vrrp vrid 3 virtual-ip 192.168.30.254

[Huawei-Vlanif20]vrrp vrid 3 priority 110

[Huawei]interface Vlanif 40

[Huawei-Vlanif40]ip address 192.168.40.253 24

[Huawei-Vlanif40]vrrp vrid 4 virtual-ip 192.168.40.254

[Huawei-Vlanif20]vrrp vrid 4 priority 110

[Huawei]interface Vlanif 70

[Huawei-Vlanif70]ip address 192.168.70.2 24

[Huawei]interface GigabitEthernet 0/0/23

[Huawei-GigabitEthernet0/0/23]port link-type access

[Huawei-GigabitEthernet0/0/23]port default vlan 70

[Huawei]interface Vlanif 80

[Huawei-Vlanif80]ip address 192.168.80.2 24

[Huawei]interface GigabitEthernet 0/0/24

[Huawei-GigabitEthernet0/0/24]port link-type access

[Huawei-GigabitEthernet0/0/24]port default vlan 80

[Huawei]ospf

[Huawei-ospf-1]area 0

[Huawei-ospf-1-area-0.0.0.0]network 192.168.10.0 0.0.0.255

[Huawei-ospf-1-area-0.0.0.0]network 192.168.20.0 0.0.0.255

[Huawei-ospf-1-area-0.0.0.0]network 192.168.30.0 0.0.0.255

[Huawei-ospf-1-area-0.0.0.0]network 192.168.40.0 0.0.0.255
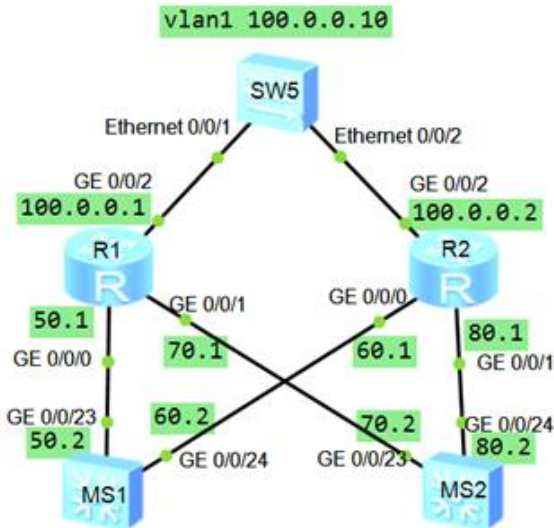
[Huawei-ospf-1-area-0.0.0.0]network 192.168.70.0 0.0.0.255

[Huawei-ospf-1-area-0.0.0.0]network 192.168.80.0 0.0.0.255

然后测试目前网络是否可以达成全网互通。

步骤四：路由器配置

按图为路由器与三层交换机相连的接口配置 ip

注:50.1 表示 ip 需要配置为 192.168.50.1

vlan1 100.0.0.10

SW5

Ethernet 0/0/1   Ethernet 0/0/2

GE 0/0/2   GE 0/0/2
100.0.0.1   100.0.0.2
R1   R2

50.1   80.1
GE 0/0/0   GE 0/0/1   GE 0/0/0   GE 0/0/1
                  70.1   60.1

GE 0/0/23   60.2   70.2   GE 0/0/24
50.2   GE 0/0/24   GE 0/0/23   80.2
MS1   MS2

R1

```
<Huawei>system-view

[Huawei]interface GigabitEthernet 0/0/0

[Huawei-GigabitEthernet0/0/0]ip address 192.168.50.1 24

[Huawei]interface GigabitEthernet 0/0/1

[Huawei-GigabitEthernet0/0/1]ip address 192.168.70.1 24
```

```
[Huawei]interface GigabitEthernet 0/0/2

[Huawei-GigabitEthernet0/0/2]ip address 100.0.0.1 8

[Huawei-GigabitEthernet0/0/2]nat static global 100.0.0.3 inside 192.168.40.1

[Huawei-GigabitEthernet0/0/2]quit

[Huawei]ip route-static 0.0.0.0 0 100.0.0.10


[Huawei]ospf

[Huawei-ospf-1]default-route-advertise

[Huawei-ospf-1]area 0

[Huawei-ospf-1-area-0.0.0.0]network 192.168.50.0 0.0.0.255

[Huawei-ospf-1-area-0.0.0.0]network 192.168.70.0 0.0.0.255
```

R2

```
<Huawei>system-view

[Huawei]interface GigabitEthernet 0/0/0

[Huawei-GigabitEthernet0/0/0]ip address 192.168.60.1 24

[Huawei]interface GigabitEthernet 0/0/1

[Huawei-GigabitEthernet0/0/1]ip address 192.168.80.1 24

[Huawei]interface GigabitEthernet 0/0/2

[Huawei-GigabitEthernet0/0/2]ip address 100.0.0.2 8

[Huawei-GigabitEthernet0/0/2]nat static global 100.0.0.4 inside 192.168.40.2
```

[Huawei-GigabitEthernet0/0/2]quit

[Huawei]ip route-static 0.0.0.0 0 100.0.0.10

[Huawei]ospf

[Huawei-ospf-1]**default-route-advertise**

[Huawei-ospf-1]area 0

[Huawei-ospf-1-area-0.0.0.0]network 192.168.60.0 0.0.0.255

[Huawei-ospf-1-area-0.0.0.0]network 192.168.80.0 0.0.0.255

三层交换机如果看不到从路由器学习来的默认路由就去检查路由器 G0/2 地址是否配置，

之后验证从内网可以访问外网设备，ping 通证明项目升级成功。