

MSTP、LACP、VRRP、DHCP、NAT综合实验技术文档

原创

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MSTP、LACP、VRRP、DHCP、NAT综合实验技术文档

要求: 要求按照拓扑图配置MSTP, VRRP, DHCP, NAT等相关命令使得图中所有终端能够网络互通

1、MSTP+链路聚合:正常情况下各VLAN流量路径要求如下:

VLAN10 : SW3->SW1->R1

VLAN20: Sw3->SW2->R1

VLAN30: SW4->SW1->R1

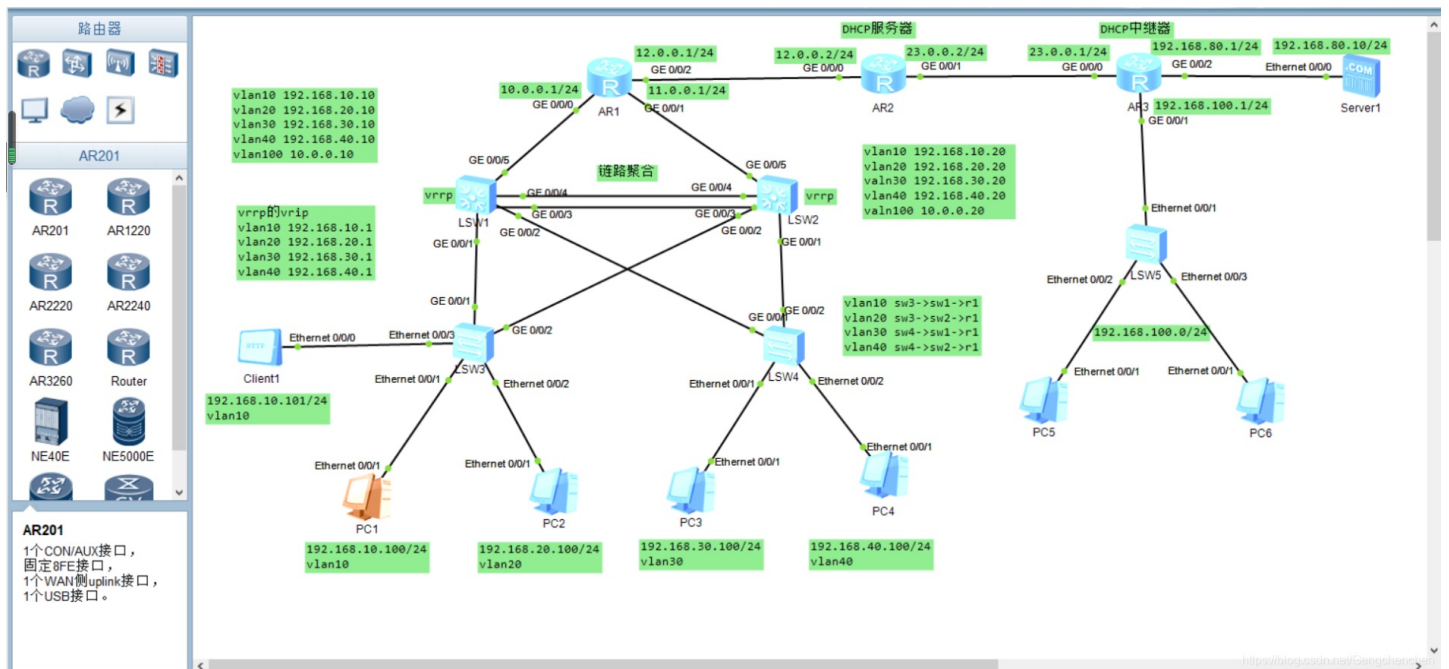
VLAN40 : SW4->SW2->R1

2、VRRP :正常情况下要求VLAN10、VLAN30的Master为sw1; VLAN20、VLAN40的Master为sw2DHCP

3、R3为DHCP中继代理, R2为DHCP服务器,为PC5,PC6提供动态分配IP服务

4、NAT : 使用EasyIp进行转换使得Client1能够使用R1的外网口IP访问外网:并使用NAT-Server使得Client1访问server1的web服务时能够使用目标网址23.0.0.3/24的8080端口进行访问所有终端能够网络互通

环境搭建如下:



在此之前记得把每个路由器的IP地址, 每个电脑的地址, 每个交换机的进出口模式(即access或者trunk), 每个三层交换机的虚拟VLAN都给配上。这些都是最基本的。不用说了吧。

1、每个路由器和三层交换机都要配上动态路由，配置这种实验，最基础的思想就是需要让全网先接通。

```
AR1
Please press enter to start cmd line!
#####
<Huawei>
<Huawei>sys
Enter system view, return user view with Ctrl+Z.
[Huawei]un in en
Info: Information center is disabled.
[Huawei]sys R1
[R1]int g0/0/0
[R1-GigabitEthernet0/0/0]ip ad 10.0.0.1 24
[R1-GigabitEthernet0/0/0]int g0/0/1
[R1-GigabitEthernet0/0/1]ip ad 11.0.0.1 24
[R1-GigabitEthernet0/0/1]int g0/0/2
[R1-GigabitEthernet0/0/2]ip ad 12.0.0.1 24
[R1-GigabitEthernet0/0/2]
<R1>sys
Enter system view, return user view with Ctrl+Z.
[R1]rip 1
[R1-rip-1]ver
[R1-rip-1]verify-source
[R1-rip-1]version 2
[R1-rip-1]un summ
[R1-rip-1]un summary
[R1-rip-1]net
[R1-rip-1]network 10.0.0.0
[R1-rip-1]network 11.0.0.0
[R1-rip-1]network 12.0.0.0
[R1-rip-1]
[R1-rip-1]
[R1-rip-1]q
[R1]di ip ro
Route Flags: R - relay, D - download to fib
-----
Routing Tables: Public
Destinations : 16      Routes : 16

Destination/Mask    Proto  Pre  Cost    Flags NextHop         Interface
-----
0/0/0              10.0.0.0/24  Direct  0    0      D    10.0.0.1           GigabitEthernet
0/0/0              10.0.0.1/32  Direct  0    0      D    127.0.0.1          GigabitEthernet
0/0/0              10.0.0.255/32 Direct  0    0      D    127.0.0.1          GigabitEthernet
0/0/0              11.0.0.0/24  Direct  0    0      D    11.0.0.1           GigabitEthernet
```

配置R1路由器的各端口的IP地址

在R1中配置动态路由(此处配置的是rip)

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此处配置ACL是为了定义访问地址，就是配置NAT中的EasyIp中需要配置上的

```
AR1
192.168.80.0/24  RIP    100  2      D    12.0.0.2           GigabitEthernet
0/0/2
192.168.100.0/24 RIP    100  2      D    12.0.0.2           GigabitEthernet
0/0/2
255.255.255.255/32 Direct  0    0      D    127.0.0.1          InLoopBack0

[R1]
<R1>
<R1>
[R1]sys
Enter system view, return user view with Ctrl+Z.
[R1]acl 3000
[R1-acl-adv-3000]rul per
[R1-acl-adv-3000]rul permit ip so
[R1-acl-adv-3000]rul permit ip source 192.168.10.0 0.0.0.255
[R1-acl-adv-3000]q
[R1]int g0/0/2
[R1-GigabitEthernet0/0/2]nat out
[R1-GigabitEthernet0/0/2]nat outbound 3000
[R1-GigabitEthernet0/0/2]
[R1-GigabitEthernet0/0/2]q
[R1]dis nat se
[R1]dis nat server
[R1]dis nat session all
NAT Session Table Information:

Total : 0
[R1]
[R1]
[R1]
[R1]
[R1]
[R1]
[R1]
[R1]
[R1]
[R1]
```

配置acl3000，使客户端1的源地址网段可以通过，并在出端口配置上该acl3000功能

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此处配置NAT映射配置错了，题中要求是使用NAT-Server使得Client1访问server1的web服务时能够使用目标网址23.0.0.3/24的8080端口进行访问所有终端能够网络互通。正确的解法是在R3路由器G0/0/0（连接公网的接口上）接口上敲上如下命令：nat server protocol tcp global 23.0.0.3 www inside 192.168.80.10 www

```
AR1
[AR1]
[AR1]int g0/0/2
[AR1-GigabitEthernet0/0/2]nat se
[AR1-GigabitEthernet0/0/2]nat server pro
[AR1-GigabitEthernet0/0/2]nat server protocol tcp go
[AR1-GigabitEthernet0/0/2]nat server protocol tcp go
[AR1-GigabitEthernet0/0/2]nat server protocol tcp glo
[AR1-GigabitEthernet0/0/2]nat server protocol tcp global 8080 in
[AR1-GigabitEthernet0/0/2]nat server protocol tcp global 8080 insi
[AR1-GigabitEthernet0/0/2]nat server protocol tcp global 8080 inside 192.168.10.1
01 www
^
Error: Wrong parameter found at '^' position.
[AR1-GigabitEthernet0/0/2]nat server protocol tcp global 8080nat server protocol
tcp global 8080 inside 192.168.10.101 www
^
Error: Incomplete command found at '^' position.
[AR1-GigabitEthernet0/0/2]nat server protocol tcp global 8080 www inside 192.168.10.1
01 www
^
Error: Wrong parameter found at '^' position.
[AR1-GigabitEthernet0/0/2]nat ser
[AR1-GigabitEthernet0/0/2]nat server pr
[AR1-GigabitEthernet0/0/2]nat server protocol tcp glo
[AR1-GigabitEthernet0/0/2]nat server protocol tcp global ?
X.X.X.X      Global IP address of NAT
current-interface Address of current interface
interface     Specify the interface
[AR1-GigabitEthernet0/0/2]nat server protocol tcp global ?
X.X.X.X      Global IP address of NAT
current-interface Address of current interface
interface     Specify the interface
[AR1-GigabitEthernet0/0/2]nat server protocol tcp global
[AR1-GigabitEthernet0/0/2]q
[AR1]int g0/0/0
[AR1-GigabitEthernet0/0/0]nat de
[AR1-GigabitEthernet0/0/0]nat ser
[AR1-GigabitEthernet0/0/0]nat server pro
[AR1-GigabitEthernet0/0/0]nat server protocol tcp glo
[AR1-GigabitEthernet0/0/0]nat server protocol tcp global cu
[AR1-GigabitEthernet0/0/0]nat server protocol tcp global current-interface 8080 i
n
[AR1-GigabitEthernet0/0/0]nat server protocol tcp global current-interface 8080 i
nside 192.168.20.10 www
[AR1-GigabitEthernet0/0/0]di th
[V200R003C00]
#
```

此处出错是因为配置的端口错误，应该配置与客户端更近的端口，即入端口

在入端口配置上NAT映射，全局模式，指向80端口的服务器，后面IP是客户端的IP地址。

此处配置是用来完成第一问的，实现不同VLAN走不同的路线实现接通

```
LSW1
[SW1-rip-1]un sum
[SW1-rip-1]un summary
[SW1-rip-1]net
[SW1-rip-1]network 10.0.0.0
[SW1-rip-1]net
[SW1-rip-1]network 192.168.10.0
[SW1-rip-1]network 192.168.20.0
[SW1-rip-1]
[SW1-rip-1]q

[SW1]stp mode ms
[SW1]stp mode mstp
[SW1]stp re
[SW1]stp region-configuration
[SW1-mst-region]re
[SW1-mst-region]region-name huawei1
[SW1-mst-region]r
[SW1-mst-region]re
[SW1-mst-region]region-name
[SW1-mst-region]revision-level 1
[SW1-mst-region]ins
[SW1-mst-region]instance 1 vlan 10 30
[SW1-mst-region]ins
[SW1-mst-region]instance 2 vl
[SW1-mst-region]instance 2 vlan 20 40
[SW1-mst-region]ac
[SW1-mst-region]active re
[SW1-mst-region]active region-configuration
[SW1-mst-region]active region-configuration
[SW1-mst-region]active region-configuration
Info: This operation may take a few seconds. Please wait for a moment...done.
[SW1-mst-region]ch
[SW1-mst-region]check re
[SW1-mst-region]check region-configuration
Admin configuration
Format selector      :0
Region name         :huawei1
Revision level      :1

Instance  VLANs Mapped
0          1 to 9, 11 to 19, 21 to 29, 31 to 39, 41 to 4094
1          10, 30
2          20, 40
[SW1-mst-region]q
```

在此三层交换机上配置动态路由，注意PC1和PC2的网段也要配置上

设置MSTP，注意两个实例1、2中，每个都有两个VLAN，这边要分清那两个VLAN是走SW1的，哪两个VLAN是走SW2的，分清优先级

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此图接上图，而且还配置了链路聚合

```
LSW1
1          10, 30
2          20, 40
[SW1-mst-region]q
[SW1]stp in
[SW1]stp instance 1 r
[SW1]stp instance 1 root p
[SW1]stp instance 1 root primary
[SW1]stp in
[SW1]stp instance 2 r
[SW1]stp instance 2 root se
[SW1]stp instance 2 root secondary
[SW1]
[SW1]lACP pri
[SW1]lACP priority 1000
[SW1]int eth-
[SW1]int Eth-Trunk 1
[SW1-Eth-Trunk1]bPdu en
[SW1-Eth-Trunk1]bPdu enable
[SW1-Eth-Trunk1]mode la
[SW1-Eth-Trunk1]mode lACP-static
[SW1-Eth-Trunk1]int g0/0/4
[SW1-GigabitEthernet0/0/4]eth-
[SW1-GigabitEthernet0/0/4]eth-trunk 1
Info: This operation may take a few seconds. Please wait for a moment...done.
[SW1-GigabitEthernet0/0/4]int g0/0/3
[SW1-GigabitEthernet0/0/3]eth-trunk 1
Info: This operation may take a few seconds. Please wait for a moment...done.
[SW1-GigabitEthernet0/0/3]dis eth-
[SW1-GigabitEthernet0/0/3]dis eth-trunk 1
Eth-Trunk1's state information is:
Local:
LAG ID: 1          WorkingMode: STATIC
Preempt Delay: Disabled      Hash arithmetic: According to SIP-XOR-DIP
System Priority: 1000        System ID: 4clf-cob3-02d3
Least Active-linknumber: 1   Max Active-linknumber: 8
```

接上图，配置两个实例的主次之分，即哪两个走SW1，哪两个走SW2

配置链路聚合

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LSW1


```
[SW1-GigabitEthernet0/0/3]q
[SW1]int eth-
[SW1]int Eth-Trunk 1
[SW1-Eth-Trunk1]max ac
[SW1-Eth-Trunk1]max active-linknumber 1
[SW1-Eth-Trunk1]
[SW1-Eth-Trunk1]
<SW1>
```

接上图，设置链路聚合一条动态一条储备

```
<SW1>sys
Enter system view, return user view with Ctrl+Z.
[SW1]int vlanif 10
[SW1-Vlanif10]vrrp vr
[SW1-Vlanif10]vrrp vrid 10 vi
[SW1-Vlanif10]vrrp vrid 10 virtual-ip 192.168.10.1
[SW1-Vlanif10]int vlanif 20
[SW1-Vlanif20]vrrp vrid 20 virtual-ip 192.168.20.1
[SW1-Vlanif20]int vlanif 30
[SW1-Vlanif30]vrrp vr
[SW1-Vlanif30]vrrp vrid 30 v
[SW1-Vlanif30]vrrp vrid 30 virtual-ip 192.168.30.1
[SW1-Vlanif30]int vlanif 40
[SW1-Vlanif40]vrrp vr
[SW1-Vlanif40]vrrp vrid 40 vr
[SW1-Vlanif40]vrrp vrid 40 vi
[SW1-Vlanif40]vrrp vrid 40 virtual-ip 192.168.40.1
[SW1-Vlanif40]vrrp vrid 10 30 pr
[SW1-Vlanif40]q
```

配置虚拟VLAN对应虚拟接口的ip地址

```
[SW1]int vlanif 10
[SW1-Vlanif10]vrrp vrid 10 pr
[SW1-Vlanif10]vrrp vrid 10 priority 120
[SW1-Vlanif10]vrrp vr
[SW1-Vlanif10]vrrp vrid 10 pr
[SW1-Vlanif10]vrrp vrid 10 priority
[SW1-Vlanif10]vrrp vrid 10 preempt-mode t
[SW1-Vlanif10]vrrp vrid 10 preempt-mode timer d
[SW1-Vlanif10]vrrp vrid 10 preempt-mode timer delay 6
[SW1-Vlanif10]vrrp vr
[SW1-Vlanif10]vrrp vrid 10 tr
[SW1-Vlanif10]vrrp vrid 10 track in
[SW1-Vlanif10]vrrp vrid 10 track interface g0/0/5
[SW1-Vlanif10]vrrp vrid 10 track interface g0/0/5 re
[SW1-Vlanif10]vrrp vrid 10 track interface g0/0/5 reduced 30
[SW1-Vlanif10]int vlanif 30
[SW1-Vlanif30]vrrp vr
[SW1-Vlanif30]vrrp vrid 30 pri
[SW1-Vlanif30]vrrp vrid 30 priority 120
[SW1-Vlanif30]vrrp vr
```

设置主备路由，在SW1中主路由是VLAN10和30，所以将这两个VLAN优先级设为120，而20和40设为115，跟踪出错时减少30

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LSW1

```
[SW1-Vlanif30]vrrp vr
[SW1-Vlanif30]vrrp vrid 30 pri
[SW1-Vlanif30]vrrp vrid 30 priority 120
[SW1-Vlanif30]vrrp vr
[SW1-Vlanif30]vrrp vrid 30 pre
[SW1-Vlanif30]vrrp vrid 30 preempt-mode t
[SW1-Vlanif30]vrrp vrid 30 preempt-mode timer d
[SW1-Vlanif30]vrrp vrid 30 preempt-mode timer delay 6
[SW1-Vlanif30]vrrp vr
[SW1-Vlanif30]vrrp vrid 30 t
[SW1-Vlanif30]vrrp vrid 30 timer
[SW1-Vlanif30]vrrp vrid 30 track in
[SW1-Vlanif30]vrrp vrid 30 track interface g0/0/5
[SW1-Vlanif30]
[SW1-Vlanif30]vrrp vrid 30 track interface g0/0/5 re
[SW1-Vlanif30]vrrp vrid 30 track interface g0/0/5 reduced 30
[SW1-Vlanif30]int vlanif 20
[SW1-Vlanif20]vrrp vr
[SW1-Vlanif20]vrrp vrid 20 pr
[SW1-Vlanif20]vrrp vrid 20 priority 115
[SW1-Vlanif20]int vlanif 40
[SW1-Vlanif40]vrrp vrid 40 priority 115
[SW1-Vlanif40]
[SW1-Vlanif40]
<SW1>sys
```

备路由优先级设为115，要比主路由低

```
Enter system view, return user view with Ctrl+Z.
```

```
[SW1]di vrrp
Vlanif10 | Virtual Router 10
State : Master
Virtual IP : 192.168.10.1
```

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配置不同VLAN走不同路线时，也有在SW2上走的VLAN，所以也需要在SW2上配置MSTP

LSW2

```
[SW2]stp mode mstp
[SW2]stp re
[SW2]stp region-configuration
[SW2-mst-region]re
[SW2-mst-region]region-name huawei1
[SW2-mst-region]re
[SW2-mst-region]region-name
[SW2-mst-region]revision-level 1
[SW2-mst-region]in
[SW2-mst-region]instance 1 vlan 10 30
[SW2-mst-region]in
[SW2-mst-region]instance 2 vlan 20 40
[SW2-mst-region]ac
[SW2-mst-region]active re
[SW2-mst-region]active region-configuration
```

```
Info: This operation may take a few seconds. Please wait for a moment...done.
```

```
[SW2-mst-region]stp in
```

```
[SW2-mst-region]stp in
[SW2-mst-region]q
[SW2]stp in
[SW2]stp instance 1 r
[SW2]stp instance 1 root se
[SW2]stp instance 1 root secondary
[SW2]in
[SW2]info-center
^
```

```
Error:Incomplete command found at '^' position.
```

```
[SW2]stp in
[SW2]stp instance 2 r
[SW2]stp instance 2 root p
[SW2]stp instance 2 root primary
```

设两个实例，设实例的主次优先级

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LSW2

```
[SW2]stp instance 2 root primary
```

```
[SW2]
```

```
<SW2>sys
```

```
Enter system view, return user view with Ctrl+Z.
```

```
[SW2]int eth-
```

```
[SW2]int Eth-Trunk
```

```
^
```

```
Error:Incomplete command found at '^' position.
```

```
[SW2]int Eth-Trunk 1
```

```
[SW2-Eth-Trunk1]bpdu en
```

```
[SW2-Eth-Trunk1]bpdu enable
```

```
[SW2-Eth-Trunk1]mo
```

```
[SW2-Eth-Trunk1]mode la
```

```
[SW2-Eth-Trunk1]mode lacp-static
```

```
[SW2-Eth-Trunk1]int g0/0/4
```

```
[SW2-GigabitEthernet0/0/4]eth-
```

```
[SW2-GigabitEthernet0/0/4]eth-trunk 1
```

```
Info: This operation may take a few seconds. Please wait for a moment...done.
```

```
[SW2-GigabitEthernet0/0/3]int g0/0/3
```

```
[SW2-GigabitEthernet0/0/3]eth-trunk 1
```

```
Info: This operation may take a few seconds. Please wait for a moment...done.
```

```
[SW2-GigabitEthernet0/0/3]q
```

```
[SW2]di eth-
```

```
[SW2]di eth-
```

```
Eth-Trunk1's state information is:
```

```
Local:
```

```
LAG ID: 1
```

```
WorkingMode: STATIC
```

```
Preempt Delay: Disabled
```

```
Hash arithmetic: According to SIP-XOR-DIP
```

```
System Priority: 32768
```

```
System ID: 4c1f-c011-18c4
```

设链路聚合

LSW2

Error: The address already exists.

```
[SW2-Vlanif20]q
[SW2]int vlanif 10
[SW2-Vlanif10]ivrrp vr
[SW2-Vlanif10]vrrp vr
[SW2-Vlanif10]vrrp vrid 10 v
[SW2-Vlanif10]vrrp vrid 10 virtual-ip 192.168.10.1
[SW2-Vlanif10]int vlanif 20
[SW2-Vlanif20]vrrp vrid 20 virtual-ip 192.168.20.1
[SW2-Vlanif20]int vlanif 30
[SW2-Vlanif30]vrrp vr
[SW2-Vlanif30]vrrp vrid 30 vr
[SW2-Vlanif30]vrrp vrid 30 vi
[SW2-Vlanif30]vrrp vrid 30 virtual-ip 192.168.30.1
[SW2-Vlanif30]int vlanif 40
[SW2-Vlanif40]vrrp vr
[SW2-Vlanif40]vrrp vrid 40 vr
[SW2-Vlanif40]vrrp vrid 40 vi
[SW2-Vlanif40]vrrp vrid 40 virtual-ip 192.168.40.1
[SW2-Vlanif40]q
[SW2]int vlanif 20
[SW2-Vlanif20]vrrp vr
[SW2-Vlanif20]vrrp vrid 20 p
[SW2-Vlanif20]vrrp vrid 20 pr
[SW2-Vlanif20]vrrp vrid 20 priority 120
[SW2-Vlanif20]vrrp vr
[SW2-Vlanif20]vrrp vrid 20 pre
[SW2-Vlanif20]vrrp vrid 20 preempt-mode t
[SW2-Vlanif20]vrrp vrid 20 preempt-mode timer d
[SW2-Vlanif20]vrrp vrid 20 preempt-mode timer delay 6
[SW2-Vlanif20]vrrp vr
[SW2-Vlanif20]vrrp vrid 20 t
[SW2-Vlanif20]vrrp vrid 20 timer
[SW2-Vlanif20]vrrp vrid 20 track in
[SW2-Vlanif20]vrrp vrid 20 track interface g
[SW2-Vlanif20]vrrp vrid 20 track interface GigabitEthernet 0/0/5
[SW2-Vlanif20]vrrp vrid 20 track interface GigabitEthernet 0/0/5 re
[SW2-Vlanif20]vrrp vrid 20 track interface GigabitEthernet 0/0/5 reduced 30
[SW2-Vlanif20]int vlanif 40
[SW2-Vlanif40]vrrp vr
[SW2-Vlanif40]vrrp vrid 40 p
[SW2-Vlanif40]vrrp vrid 40 pr
[SW2-Vlanif40]vrrp vrid 40 priority 120
[SW2-Vlanif40]vrrp vr
[SW2-Vlanif40]vrrp vrid 40 pr
[SW2-Vlanif40]vrrp vrid 40 priority
[SW2-Vlanif40]vrrp vrid 40 preempt-mode t
[SW2-Vlanif40]vrrp vrid 40 preempt-mode timer d
```

配置虚拟VLAN的虚拟接口的地址

主备路由设置，在SW2中，主路由时VLAN20和40，次时VLAN10和30

LSW2

```
[SW2-Vlanif20]vrrp vrid 20 track interface GigabitEthernet 0/0/5
[SW2-Vlanif20]vrrp vrid 20 track interface GigabitEthernet 0/0/5 re
[SW2-Vlanif20]vrrp vrid 20 track interface GigabitEthernet 0/0/5 reduced 30
[SW2-Vlanif20]int vlanif 40
[SW2-Vlanif40]vrrp vr
[SW2-Vlanif40]vrrp vrid 40 p
[SW2-Vlanif40]vrrp vrid 40 pr
[SW2-Vlanif40]vrrp vrid 40 priority 120
[SW2-Vlanif40]vrrp vr
[SW2-Vlanif40]vrrp vrid 40 pr
[SW2-Vlanif40]vrrp vrid 40 priority
[SW2-Vlanif40]vrrp vrid 40 preempt-mode t
[SW2-Vlanif40]vrrp vrid 40 preempt-mode timer d
[SW2-Vlanif40]vrrp vrid 40 preempt-mode timer delay 6
```

接上图设置主备路


```

[SW2-Vlanif40]vrrp vr
[SW2-Vlanif40]vrrp vrid 40 tr
[SW2-Vlanif40]vrrp vrid 40 track in
[SW2-Vlanif40]vrrp vrid 40 track interface g
[SW2-Vlanif40]vrrp vrid 40 track interface GigabitEthernet 0/0/5 re
[SW2-Vlanif40]vrrp vrid 40 track interface GigabitEthernet 0/0/5 reduced 30
[SW2-Vlanif40]int vlanif 10
[SW2-Vlanif10]vrrp vr
[SW2-Vlanif10]vrrp vrid 10 p
[SW2-Vlanif10]vrrp vrid 10 pr
[SW2-Vlanif10]vrrp vrid 10 priority 115
[SW2-Vlanif10]int vlanif 30
[SW2-Vlanif30]vrrp vrid 30 priority 115
[SW2-Vlanif30]q
[SW2]dis vrrp
Vlanif10 | Virtual Router 10
State : Backup

```

配置VRRP主备路由

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在配MSTP时不能忘记在两个交换机SW3和SW4中也要开通MSTP功能，同时配置上两个实例，不过这边不用配置主次优先级。

LSW3

```

[SW3-Ethernet0/0/3]int g0/0/1
[SW3-GigabitEthernet0/0/1]p 1 t
[SW3-GigabitEthernet0/0/1]p t a v a
[SW3-GigabitEthernet0/0/1]int g0/0/2
[SW3-GigabitEthernet0/0/2]p 1 t
[SW3-GigabitEthernet0/0/2]p t a v a
[SW3-GigabitEthernet0/0/2]
<SW3>ping 192.168.80.1
PING 192.168.80.1: 56 data bytes, press CTRL_C to break
Request time out
Request time out
Request time out
Request time out
Request time out

--- 192.168.80.1 ping statistics ---
5 packet(s) transmitted
0 packet(s) received
100.00% packet loss

<SW3>
<SW3>
<SW3>
<SW3>sys
Enter system view, return user view with Ctrl+Z.
[SW3]stp mode ms
[SW3]stp mode mstp
[SW3]stp re
[SW3]stp region-configuration
[SW3-mst-region]re
[SW3-mst-region]region-name huawei1
[SW3-mst-region]re
[SW3-mst-region]region-name
[SW3-mst-region]revision-level 1
[SW3-mst-region]in
[SW3-mst-region]instance 1 v
[SW3-mst-region]instance 1 vlan 10 30
[SW3-mst-region]in
[SW3-mst-region]instance 2 v
[SW3-mst-region]instance 2 vlan 20 40
[SW3-mst-region]ac
[SW3-mst-region]active re
[SW3-mst-region]active region-configuration
Info: This operation may take a few seconds. Please wait for a moment...done.
[SW3-mst-region]
<SW3>

```

基础知识，设置接口模式，不做赘述

此处要将SW1和SW2中设置的两个实例也要配置在此交换机中

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LSW4

```

[Huawei]un in en
Info: Information center is disabled.
[Huawei]sys SW4
[SW4]vlan ba
[SW4]vlan batch 10 20 30 40
Info: This operation may take a few seconds. Please wait for a moment...done.
[SW4]int e0/0/1
[SW4-Ethernet0/0/1]p l a
[SW4-Ethernet0/0/1]p d v 30
[SW4-Ethernet0/0/1]int e0/0/2
[SW4-Ethernet0/0/2]p l a
[SW4-Ethernet0/0/2]p d v 40
[SW4-Ethernet0/0/2]int g0/0/1
[SW4-GigabitEthernet0/0/1]p l t
[SW4-GigabitEthernet0/0/1]p t a v a
[SW4-GigabitEthernet0/0/1]int g0/0/2
[SW4-GigabitEthernet0/0/2]p l t
[SW4-GigabitEthernet0/0/2]p t a v a
[SW4-GigabitEthernet0/0/2]
<SW4>sys
Enter system view, return user view with Ctrl+Z.
[SW4]stp mode ms
[SW4]stp mode mstp
[SW4]stp re
[SW4]stp region-configuration
[SW4-mst-region]re
[SW4-mst-region]region-name huaweil
[SW4-mst-region]re
[SW4-mst-region]region-name
[SW4-mst-region]revision-level 1
[SW4-mst-region]in
[SW4-mst-region]instance 1
      ^
Error:Incomplete command found at '^' position.
[SW4-mst-region]instance 1 v
[SW4-mst-region]instance 1 vlan 10 30
[SW4-mst-region]in
[SW4-mst-region]instance 2 v
[SW4-mst-region]instance 2 vlan 20 40
[SW4-mst-region]ac
[SW4-mst-region]active re
[SW4-mst-region]active region-configuration
Info: This operation may take a few seconds. Please wait for a moment...done.
[SW4-mst-region]
<SW4>
<SW4>

```

基础：自己看

两个实例也要配上，别问为什么，不然别想ping通

AR3

```
Please press enter to start cmd line!

<Huawei>
<Huawei>sys
Enter system view, return user view with Ctrl+Z.
[Huawei]un in en
Info: Information center is disabled.
[Huawei]sys R3
[R3]int g0/0/0
[R3-GigabitEthernet0/0/0]ip ad 23.0.0.1 24
[R3-GigabitEthernet0/0/0]int g0/0/1
[R3-GigabitEthernet0/0/1]ip ad 192.168.100.1 24
[R3-GigabitEthernet0/0/1]int g0/0/2
[R3-GigabitEthernet0/0/2]ip ad 192.168.80.1 24
[R3-GigabitEthernet0/0/2]
<R3>sys
Enter system view, return user view with Ctrl+Z.
[R3]rip 1
[R3-rip-1]ver
[R3-rip-1]verify-source
[R3-rip-1]version 2
[R3-rip-1]un sum
[R3-rip-1]un summary
[R3-rip-1]net
[R3-rip-1]network 23.0.0.0
[R3-rip-1]net
[R3-rip-1]network 192.168.80.0
[R3-rip-1]net
[R3-rip-1]network 192.168.100.0
[R3-rip-1]
[R3-rip-1]
[R3-rip-1]q
[R3]di p ro
[R3]di ip ro
Route Flags: R - relay, D - download to fib
```

配IP和配动态路由，自己看，很基础

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R3做中继器，所以需要在R3上开启DHCP中继器的功能

AR3

```
<R3>
<R3>sys
Enter system view, return user view with Ctrl+Z.
[R3]dhcp en
[R3]dhcp enable
Info: The operation may take a few seconds. Please wait for a moment.done.
[R3]int g0/0/1
[R3-GigabitEthernet0/0/1]dhcp se
[R3-GigabitEthernet0/0/1]dhcp select re
[R3-GigabitEthernet0/0/1]dhcp select relay
[R3-GigabitEthernet0/0/1]dhcp re
[R3-GigabitEthernet0/0/1]dhcp relay ser
[R3-GigabitEthernet0/0/1]dhcp relay server-ip 23.0.0.2
[R3-GigabitEthernet0/0/1]ip ad 192.168.100.1 24
Error: The address already exists.
[R3-GigabitEthernet0/0/1]q
[R3]

Please check whether system data has been changed, and save data in time

Configuration console time out, please press any key to log on

<R3>sys
Enter system view, return user view with Ctrl+Z.
[R3]dis th
[V200R003C00]
#
 sysname R3
#
 snmp-agent local-engineid 800007DB03000000000000
 snmp-agent
#
 clock timezone China-Standard-Time minus 08:00:00
#
```

做中继器需要敲的几个命令，很简单

```
# portal local-server load portalpage.zip
#
drop illegal-mac alarm
#
undo info-center enable
#
```

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AR2

Please press enter to start cmd line!

```
<R2>
<R2>sys
Enter system view, return user view with Ctrl+Z.
[R2]un in en
Info: Information center is disabled.
[R2]int g0/0/0
[R2-GigabitEthernet0/0/0]ip ad 12.0.0.2 24
Error: The address already exists.
[R2-GigabitEthernet0/0/0]
[R2-GigabitEthernet0/0/0]
[R2-GigabitEthernet0/0/0]
[R2-GigabitEthernet0/0/0]
[R2-GigabitEthernet0/0/0]int g0/0/1
[R2-GigabitEthernet0/0/1]ip ad 23.0.0.2 24
Error: The address already exists.
[R2-GigabitEthernet0/0/1]
```

配IP, 配动态路由

```
<R2>sys
Enter system view, return user view with Ctrl+Z.
[R2]rip 1
[R2-rip-1]ve
[R2-rip-1]verify-source
[R2-rip-1]version 2
[R2-rip-1]un sum
[R2-rip-1]un summary
[R2-rip-1]net
[R2-rip-1]network 12.0.0.0
[R2-rip-1]net
[R2-rip-1]network 23.0.0.0
[R2-rip-1]
[R2-rip-1]q
[R2]di ip ro
[R2]di ip ro
Route Flags: R - relay, D - download to fib
```

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R2作为DHCP服务器，用来分配IP地址，所以需要创建一个地址池，用来分配IP。

```
[R2]
<R2>
<R2>sys
Enter system view, return user view with Ctrl+Z.
[R2]dhcp en
[R2]dhcp enable
[R2]int g0/0/1
[R2-GigabitEthernet0/0/1]dhcp se
[R2-GigabitEthernet0/0/1]dhcp select go
[R2-GigabitEthernet0/0/1]dhcp select gl
[R2-GigabitEthernet0/0/1]dhcp select global
[R2-GigabitEthernet0/0/1]q
[R2]ip pool 1
[R2-ip-pool-1]ga
[R2-ip-pool-1]gateway-list 192.168.100.1
Error:Please delete all sections of the pool before modifying the gateway IP address.
[R2-ip-pool-1]net
[R2-ip-pool-1]netbios-type
[R2-ip-pool-1]network 192.168.100.0 mask 255.255.255.0
Error:Please delete the network section first.
[R2-ip-pool-1]
[R2-ip-pool-1]
[R2-ip-pool-1]un gat
[R2-ip-pool-1]un gateway-list all
Error:Please delete all sections of the pool before modifying the gateway IP address.
[R2-ip-pool-1]un gateway-list
Error:Incomplete command found at '^' position.
[R2-ip-pool-1]un gateway-list 192.168.100.1
Error:Please delete all sections of the pool before modifying the gateway IP address.
[R2-ip-pool-1]di th
[V200R003C00]
#
ip pool 1
 gateway-list 192.168.100.1
 network 192.168.100.0 mask 255.255.255.0
 lease day 7 hour 0 minute 0
 dns-list 8.8.8.8
#
return
[R2-ip-pool-1]
[R2-ip-pool-1]
```

开启DHCP功能，全局模式，创建地址池，将需要自动获取IP的网段配置进地址池。这里我之前配过来才出现报错。

PC1

基础配置 命令行 组播 UDP发包工具 串口

主机名:

MAC 地址:

IPv4 配置

静态 DHCP 自动获取 DNS 服务器地址

IP 地址: DNS1:

子网掩码: DNS2:

网关:

IPv6 配置

静态 DHCPv6

IPv6 地址:

前缀长度:

IPv6 网关:

应用

<https://blog.csdn.net/Gengchenchen>

PC1

基础配置 命令行 组播 UDP发包工具 串口

```
20.00% packet loss
round-trip min/avg/max = 0/105/125 ms

PC>tracert 192.168.30.100

tracert to 192.168.30.100, 8 hops max
(ICMP), press Ctrl+C to stop
 1 192.168.10.10    31 ms  47 ms  47 ms
 2   *192.168.30.100 125 ms 109 ms

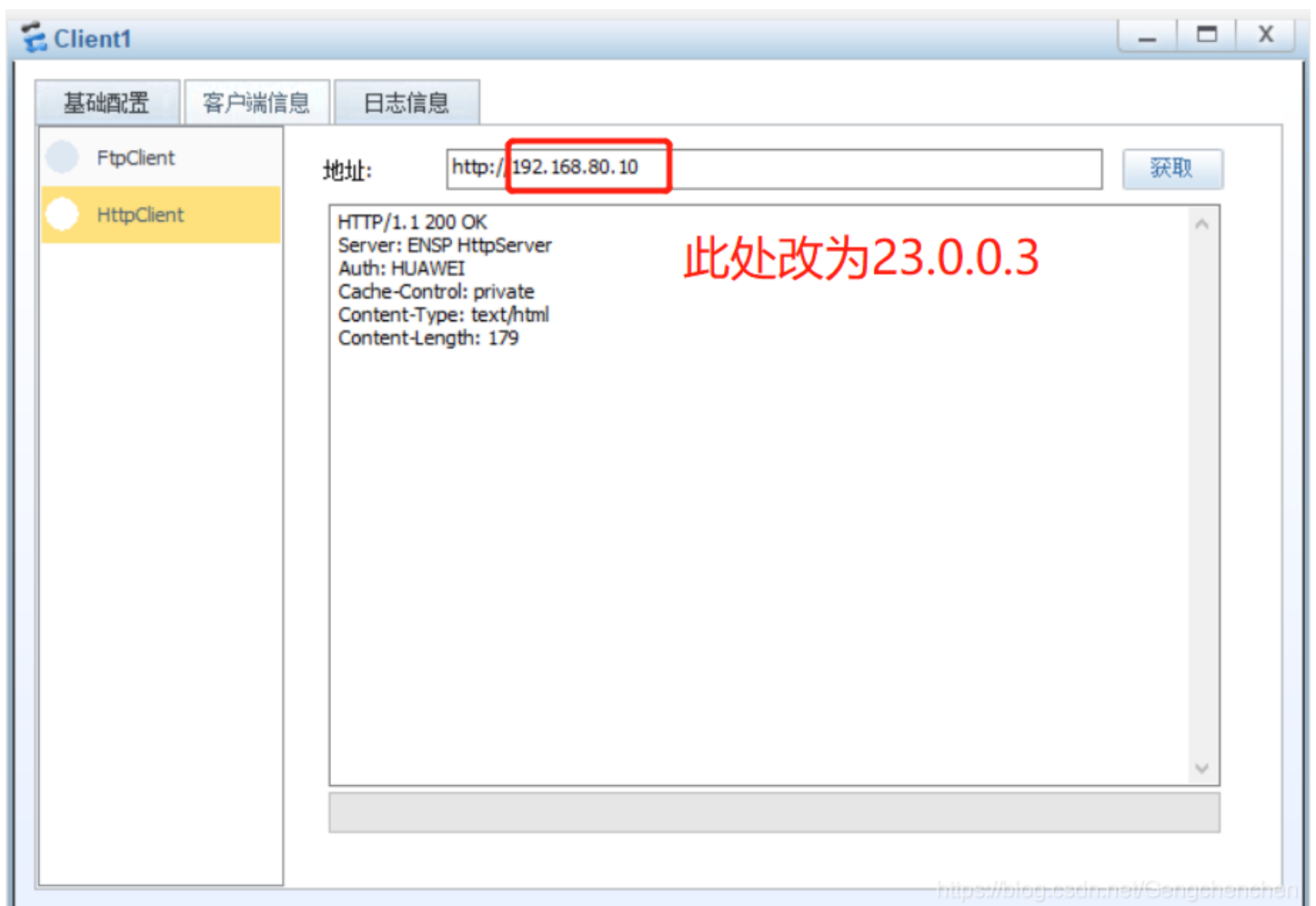
PC>ping 192.168.100.254

Ping 192.168.100.254: 32 data bytes, Press Ctrl_C to break
Request timeout!
From 192.168.100.254: bytes=32 seq=2 ttl=124 time=94 ms
From 192.168.100.254: bytes=32 seq=3 ttl=124 time=110 ms
From 192.168.100.254: bytes=32 seq=4 ttl=124 time=93 ms
From 192.168.100.254: bytes=32 seq=5 ttl=124 time=78 ms

--- 192.168.100.254 ping statistics ---
 5 packet(s) transmitted
 4 packet(s) received
20.00% packet loss
round-trip min/avg/max = 0/93/110 ms

PC>
```

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Server1

基础配置 服务器信息 日志信息

Mac地址: 54-89-98-7E-2D-69 (格式:00-01-02-03-04-05)

IPV4配置

本机地址: 192 . 168 . 80 . 10 子网掩码: 255 . 255 . 255 . 0

网关: 192 . 168 . 80 . 1 域名服务器: 0 . 0 . 0 . 0

PING测试

目的IPV4: 0 . 0 . 0 . 0 次数: [] 发送

本机状态: 设备启动 ping 成功: 0 失败: 0

保存

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PC5

基础配置 命令行 组播 UDP发包工具 串口

主机名: dc3

MAC 地址: 54-89-98-25-3B-03

IPv4 配置

静态 DHCP 自动获取 DNS 服务器地址

IP 地址: [. . .] DNS1: [. . .]

子网掩码: [. . .] DNS2: [. . .]

网关: [. . .]

IPv6 配置

静态 DHCPv6

IPv6 地址: [::]

前缀长度: 128

IPv6 网关: [::]

应用

<https://blog.csdn.net/Gengchenchen>

The image shows a window titled "PC5" with a menu bar containing "基础配置", "命令行", "组播", "UDP发包工具", and "串口". The main area is a black terminal window with white text. It displays the output of the 'ipconfig' command, showing IPv6 and IPv4 settings. A URL is visible in the bottom right corner of the terminal area.

```
PC5
基础配置  命令行  组播  UDP发包工具  串口
Welcome to use PC Simulator!

PC>ipconfig

Link local IPv6 address.....: fe80::5689:98ff:fe25:3b03
IPv6 address.....: :: / 128
IPv6 gateway.....: ::
IPv4 address.....: 192.168.100.253
Subnet mask.....: 255.255.255.0
Gateway.....: 192.168.100.1
Physical address.....: 54-89-98-25-3B-03
DNS server.....: 8.8.8.8

PC>
```

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就这样完成啦！