实验：DHCP

HCIP 分解实验 - DHCP

臧家林制作

DHCP 基础实验 1： DHCP 接口地址池配置
DHCP 基础实验 2： DHCP 全局地址池配置
DHCP 基础实验 3： DHCP 中继配置

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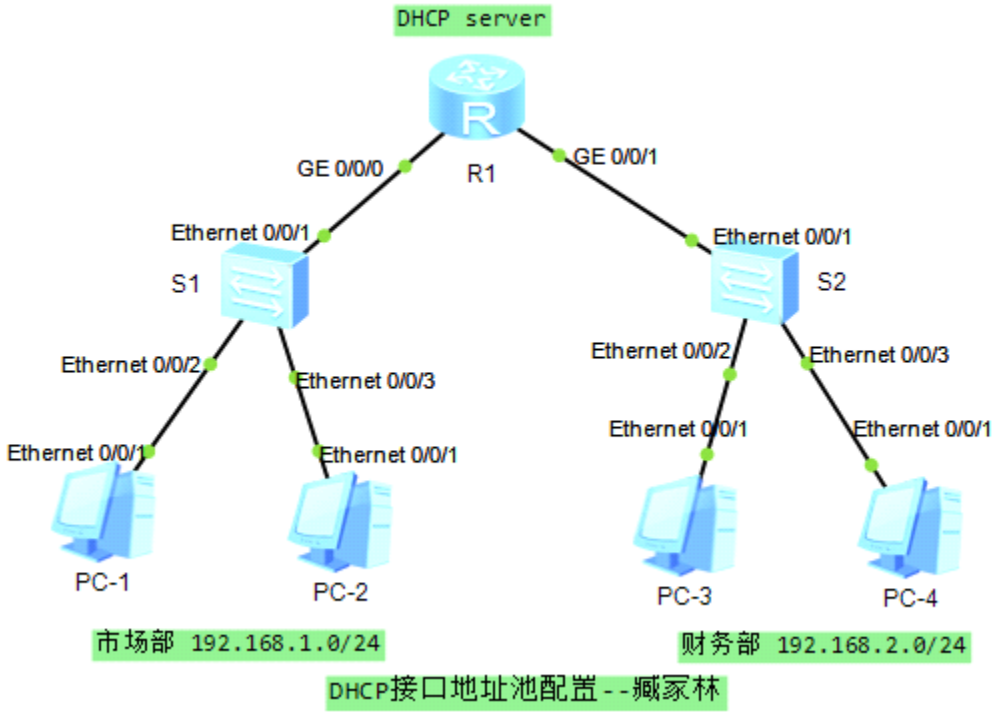
DHCP 基础实验 1： DHCP 接口地址池配置



R1 做为 DHCP 的服务器

R1：配置接口 IP 地址

undo ter mo
sys
sysname R1
user-interface console 0
idle-timeout 0 0
int g0/0/0
ip add 192.168.1.254 24
int g0/0/1
ip add 192.168.2.254 24
q

配置 DHCP
R1：
dhcp enable

int g0/0/0
dhcp select interface
dhcp server dns-list 192.168.1.254
dhcp server excluded-ip-address 192.168.1.1 192.168.1.10
dhcp server lease day 3
int g0/0/1
dhcp select interface
q

配置完成后，查看 PC DHCP 能否获取到地址 ipconfig
4 台 PC 应该能相互 ping 通

```
PC>ipconfig

Link local IPv6 address...........: fe80::5689:98ff:fe2a:6c9
IPv6 address......................: :: / 128
IPv6 gateway......................: ::
IPv4 address......................: 192.168.1.252
Subnet mask.......................: 255.255.255.0
Gateway...........................: 192.168.1.254
Physical address..................: 54-89-98-2A-06-C9
DNS server........................: 1.1.1.1
                                    192.168.1.254
```

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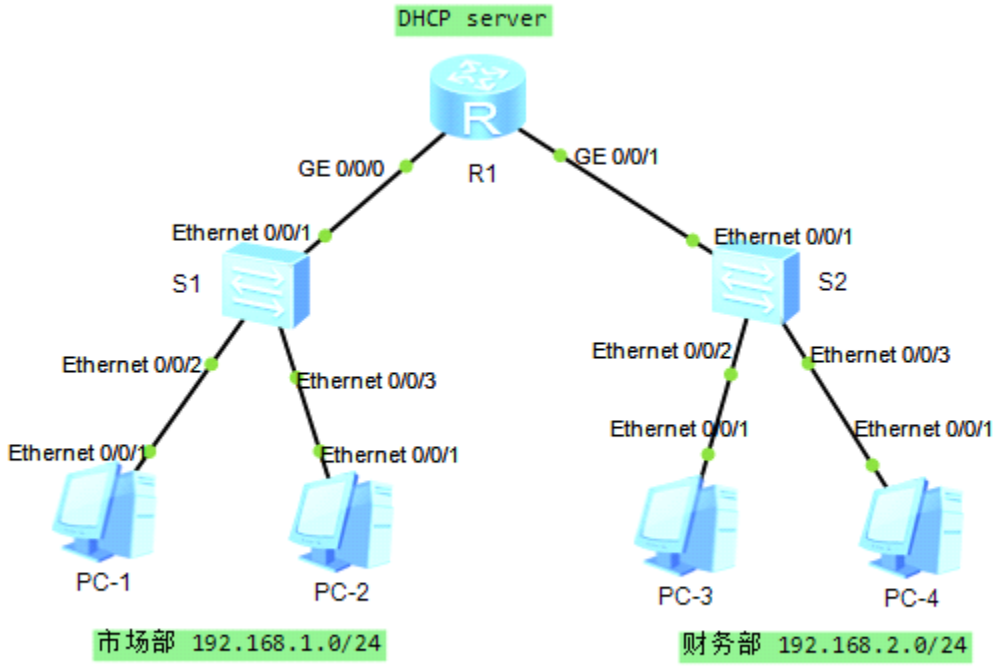
DHCP 基础实验 2： DHCP 全局地址池配置



DHCP全局地址池配置--臧家林

基本接口的配置与上面的实验相同

R1：

```
dhcp enable
ip pool dhcp1
gateway-list 192.168.1.254
network 192.168.1.0 mask 255.255.255.0
excluded-ip-address 192.168.1.1 192.168.1.10
lease day 3
dns-list 1.1.1.1
ip pool dhcp2
gateway-list 192.168.2.254
network 192.168.2.0 mask 255.255.255.0
int g0/0/0
dhcp select global
int g0/0/1
dhcp select global
```

PC 查看 ipconfig ，也可以获取到地址

R1 ： display ip pool

```
[R1]dis ip pool
  ------------------------------------------------------------
  Pool-name      : dhcp1
  Pool-No        : 0
  Position       : Local          Status          : Unlocked
  Gateway-0      : 192.168.1.254
  Mask           : 255.255.255.0
  VPN instance   : --

  ------------------------------------------------------------
  Pool-name      : dhcp2
  Pool-No        : 1
  Position       : Local          Status          : Unlocked
  Gateway-0      : 192.168.2.254
```

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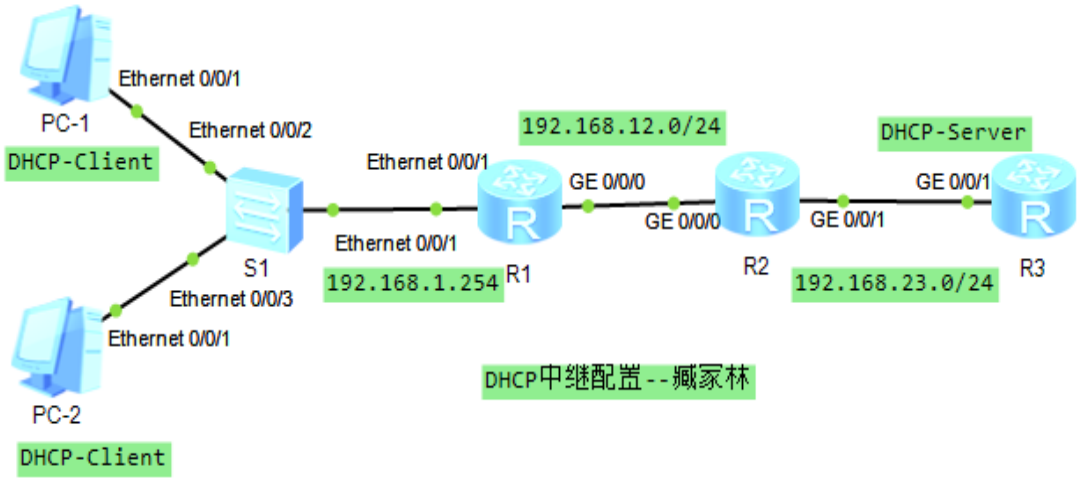
DHCP 基础实验 3： DHCP 中继配置



基础配置

R1:
undo ter mo
sys
sysname R1
user-interface console 0
idle-timeout 0 0
int g0/0/0
ip add 192.168.12.1 24
int e0/0/1
ip add 192.168.1.254 24
q

ospf router-id 1.1.1.1
area 0
network 192.168.1.254   0.0.0.0
network 192.168.12.1 0.0.0.0
q

R2:
undo ter mo
sys
sysname R2
user-interface console 0
idle-timeout 0 0
int g0/0/0
ip add 192.168.12.2 24
int g0/0/1
ip add 192.168.23.2 24
q

ospf router-id 2.2.2.2
area 0
network 192.168.12.2 0.0.0.0

network 192.168.23.2 0.0.0.0
q

R3:
undo ter mo
sys
sysname R3
user-interface console 0
idle-timeout 0 0
int g0/0/1
ip add 192.168.23.3 24
q

ospf router-id 3.3.3.3
area 0
network 192.168.23.3 0.0.0.0
q

R3 做为 DHCP Server 配置
R3:
dhcp enable
ip pool dhcp
gateway-list 192.168.1.254
network 192.168.1.0 mask 255.255.255.0
int g0/0/1
dhcp select global

R1 做为 DHCP 的中继配置
R1:
dhcp enable
int e0/0/1
dhcp select relay
dhcp relay server-ip 192.168.23.3

验证 PC ipconfig 能获取到 IP 地址

```
PC>ipconfig

Link local IPv6 address...........: fe80::5689:98ff:fecf:4c53
IPv6 address......................: :: / 128
IPv6 gateway......................: ::
IPv4 address......................: 192.168.1.252
Subnet mask.......................: 255.255.255.0
Gateway...........................: 192.168.1.254
Physical address..................: 54-89-98-CF-4C-53
DNS server........................:
```

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SW1 配置 DHCP Snooping

1.使能 DHCP Snooping 功能。
2.配置接口的信任状态，以保证客户端从合法的服务器获取 IP 地址。
3.使能 ARP 与 DHCPSnooping 的联动功能，保证 DHCP 用户在异常下线时实时更新绑定表。
4.使能根据 DHCP Snooping 绑定表生成接口的静态 MAC 表项功能，以防止非 DHCP 用户攻击。
5.使能对 DHCP 报文进行绑定表匹配检查的功能，防止仿冒 DHCP 报文攻击。
6.配置 DHCP 报文上送 DHCP 报文处理单元的最大允许速率，防止 DHCP 报文泛洪攻击。
7.配置允许接入的最大用户数以及使能检测 DHCP Request

SW1：
dhcp enable
dhcp snooping enable

在 VLAN 1 中开启，或者在连接用户侧接口开启
dhcp snooping enable vlan 1

或者
int e0/0/2
dhcp snooping enable
int e0/0/3
dhcp snooping enable

配置接口的信任状态：将连接 DHCP Server 的接口状态配置为“Trusted”
int e0/0/1
dhcp snooping trusted

使能 ARP 与 DHCPSnooping 的联动功能。
arp dhcp-snooping-detect enable

使能对 DHCP 报文进行绑定表匹配检查的功能。
int e0/0/1
dhcp snooping check dhcp-request enable

配置 DHCP 报文上送 DHCP 报文处理单元的最大允许速率为 10pps。
dhcp snooping check dhcp-rate enable
dhcp snooping check dhcp-rate 10

配置接口允许接入的最大用户数。
int e0/0/1
dhcp snooping max-user-number 2

查看 DHCP Snooping 的配置信息。display dhcp snooping configuration

```
[SW1]display dhcp snooping configuration
#
dhcp snooping enable
dhcp snooping check dhcp-rate enable
dhcp snooping check dhcp-rate 10
arp dhcp-snooping-detect enable
#
vlan 1
 dhcp snooping enable
#
interface Ethernet0/0/1
 dhcp snooping trusted
 dhcp snooping check dhcp-request enable
 dhcp snooping max-user-number 2
```

查看接口下的 DHCP Snooping 运行信息。display dhcp snooping interface e0/0/1

```
[SW1]display dhcp snooping interface e0/0/1
 DHCP snooping running information for interface Ethernet0/0/1
 DHCP snooping                                : Disable  (default)
 Trusted interface                            : Yes
 Dhcp user max number                         : 2
 Current dhcp user number                     : 0
 Check dhcp-giaddr                            : Disable  (default)
 Check dhcp-chaddr                            : Disable  (default)
 Alarm dhcp-chaddr                            : Disable  (default)
 Check dhcp-request                           : Enable
 Alarm dhcp-request                           : Disable  (default)
 Check dhcp-rate                              : Disable  (default)
 Alarm dhcp-rate                              : Disable  (default)
 Alarm dhcp-rate threshold                    : 100
 Discarded dhcp packets for rate limit        : 0
 Alarm dhcp-reply                             : Disable  (default)
```