WX系列AC+Fit AP穿越NAT典型配置（集中转发）

wlan接入 NAT 王森森 2012-10-09 发表

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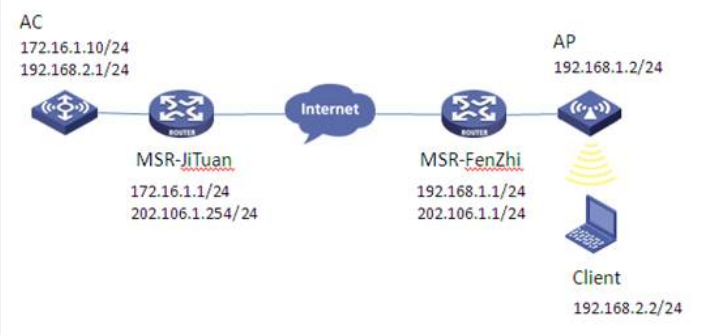
一、组网需求：

WX系列AC、FIT AP、路由器、便携机（安装有无线网卡）

二、组网图：



本典型配置举例中AC使用WX5004无线控制器，版本为R2308P07。AC和AP分别位于私网内，通过集团路由器和分支路由器穿越Internet实现互通。

分支侧MSR-FenZhi作为AP网关（192.168.1.1/24）并设置互联地址（202.106.1.1/24），配置DHCP Server为AP分配IP地址，在外网口配置动态地址转换将AP的IP地址映射公网IP地址。

集团侧MSR-JiTuan作为AC网关（172.16.1.1/24）、并设置互联地址（202.106.1.254/24），在外网口配置静态地址转换将AC的IP地址一对一静态映射为公网IP地址。无线控制器AC作为用户业务网关（192.168.2.1/24），配置DHCP Server为Client分配IP地址。

三、特性介绍：

AC和AP间穿越NAT通过AC同时纪录AP的IP地址和端口号信息，实现处于NAT设备内部的AP注册到AC。

AP与AC之间共要建立两条隧道，控制隧道和数据隧道。穿过NAT后，两条隧道的AP端IP地址和端口号都会被转换。AC会面临两个问题：第一，如何建立控制隧道和数据隧道的对应关系；第二，在数据隧道没有数据传送时，如何保活NAT会话。解决方式：数据隧道新增一类报文“数据保活报文”，通过周期性的发送来保活NAT会话；然后其携带的session id帮助AC实现数据隧道和控制隧道的关联。AC的B96版本默认支持AP到AC之间穿越NAT，不需要任何配置。

在MSR-JiTuan侧配置静态地址转换将私网AC的IP地址一对一静态映射为公网IP地址，可以实现AC位于私网内的应用环境。

四、配置信息：

1．AC的配置信息：

```
#
 version 5.20, Release 2308P07
#
 sysname AC
#
 domain default enable system
#
 telnet server enable
#
 port-security enable
#
vlan 1
#
```

```
vlan 2
#
domain system
 access-limit disable
 state active
 idle-cut disable
 self-service-url disable
#
dhcp server ip-pool vlan2
 network 192.168.2.0 mask 255.255.255.0
 gateway-list 192.168.2.1
#
user-group system
 group-attribute allow-guest
#
local-user admin
 password simple admin
 authorization-attribute level 3
 service-type telnet
#
wlan rrm
 dot11a mandatory-rate 6 12 24
 dot11a supported-rate 9 18 36 48 54
 dot11b mandatory-rate 1 2
 dot11b supported-rate 5.5 11
 dot11g mandatory-rate 1 2 5.5 11
 dot11g supported-rate 6 9 12 18 24 36 48 54
#
wlan service-template 1 clear
 ssid h3c-nat
 bind WLAN-ESS 1
 service-template enable
#
interface NULL0
#
interface Vlan-interface1
 ip address 172.16.1.10 255.255.255.0
#
interface Vlan-interface2
 ip address 192.168.2.1 255.255.255.0
#
interface GigabitEthernet1/0/1
#
interface GigabitEthernet1/0/2
#
interface GigabitEthernet1/0/3
#
interface GigabitEthernet1/0/4
#
interface Ten-GigabitEthernet1/0/5
#
interface WLAN-ESS1
 port access vlan 2
#
wlan ap ap1 model WA2610i-GN id 1
 trap enable
 serial-id 219801A0CLC124000294
```

```
 radio 1
  service-template 1
  radio enable
#
 ip route-static 202.106.1.0 255.255.255.0 172.16.1.1
#
 undo info-center logfile enable
#
 dhcp server forbidden-ip 192.168.2.1
#
 dhcp enable
#
 arp-snooping enable
#
 load xml-configuration
#
user-interface con 0
user-interface vty 0 4
 authentication-mode scheme
 user privilege level 3
#
Return
```

2．MSR-JiTuan的配置信息：

```
#
 version 5.20, Release 2209P15
#
 sysname MSR-JiTuan
#
 domain default enable system
#
 dar p2p signature-file flash:/p2p_default.mtd
#
 port-security enable
#
vlan 1
#
domain system
 access-limit disable
 state active
 idle-cut disable
 self-service-url disable
#
user-group system
 group-attribute allow-guest
#
local-user admin
 password cipher $c$3$40gC1cxf/wlJNa1ufFPJsjKAof+QP5aV
 authorization-attribute level 3
 service-type telnet
#
cwmp
 undo cwmp enable
#
interface Aux0
 async mode flow
 link-protocol ppp
#
```

```
interface Cellular0/0
 async mode protocol
 link-protocol ppp
#
interface Ethernet0/0
 port link-mode route
 ip address 172.16.1.1 255.255.255.0
#
interface Ethernet0/1
 port link-mode route
 nat outbound static
 ip address 202.106.1.254 255.255.255.0
#
interface NULL0
#
#
voice-setup
 #
 sip
 #
 sip-server
  #
  call-rule-set
  #
  call-route
 #
 dial-program
  default entity fax protocol standard-t38
  default entity fax protocol standard-t38 hb-redundancy 0
  default entity fax protocol standard-t38 lb-redundancy 0
 #
 aaa-client
 #
 gk-client
#
 nat static 172.16.1.10 202.106.1.253
#
 load xml-configuration
#
 load tr069-configuration
#
user-interface tty 12
user-interface aux 0
user-interface vty 0 4
 authentication-mode scheme
#
Return
```

3．MSR-FenZhi的配置信息

```
#
 version 5.20, Release 2104P02
#
 sysname MSR-FenZhi
#
 nat address-group 1 202.106.1.2 202.106.1.10
#
 domain default enable system
#
```

```
 dar p2p signature-file flash:/p2p_default.mtd
#
 port-security enable
#
acl number 2001
 rule 0 permit source 192.168.1.0 0.0.0.255
 rule 5 deny
#
vlan 1
#
domain system
 access-limit disable
 state active
 idle-cut disable
 self-service-url disable
#
dhcp server ip-pool ap
 network 192.168.1.0 mask 255.255.255.0
 gateway-list 192.168.1.1
 option 43 hex  80070000 01CA6A01 FD  //AC地址为202.106.1.253
#
user-group system
#
local-user admin
 password cipher .]@USE=B,53Q=^Q`MAF4<1!!
 authorization-attribute level 3
 service-type telnet
#
cwmp
 undo cwmp enable
#
interface Aux0
 async mode flow
 link-protocol ppp
#
interface Cellular0/0
 async mode protocol
 link-protocol ppp
#
interface NULL0
#
interface Vlan-interface1
 ip address 192.168.1.1 255.255.255.0
#
interface GigabitEthernet0/0
 port link-mode route
 nat outbound 2001 address-group 1
 ip address 202.106.1.1 255.255.255.0
#
interface GigabitEthernet0/1
 port link-mode bridge
#
interface GigabitEthernet0/2
 port link-mode route
#
interface GigabitEthernet0/3
 port link-mode route
```

```
#
interface GigabitEthernet0/4
 port link-mode route
#
 ip route-static 0.0.0.0 0.0.0.0 202.106.1.254
#
 dhcp server forbidden-ip 192.168.1.1
#
 dhcp enable
#
 load xml-configuration
#
 load tr069-configuration
#
user-interface tty 12
user-interface aux 0
user-interface vty 0 4
 authentication-mode scheme
#
Return
```

五、主要配置步骤：

1．AC配置：

```
#创建VLAN，并配置VLAN接口IP地址。
system-view
[AC] vlan 2
[AC –vlan2] quit
[AC] interface Vlan-interface1
[AC-Vlan-interface1] ip address 172.16.1.10 255.255.255.0
[AC-Vlan-interface1] quit
[AC] interface Vlan-interface2
[AC-Vlan-interface2] ip address 192.168.2.1 255.255.255.0
[AC-Vlan-interface2] quit
#配置DHCP server。
[AC] dhcp enable
[AC] dhcp server ip-pool vlan2
[AC- dhcp server ip-pool vlan2] network 192.168.2.0 mask 255.255.255.0
[AC- dhcp server ip-pool vlan2] gateway-list 192.168.2.1
[AC- dhcp server ip-pool vlan2] quit
[AC] dhcp server forbidden-ip 192.168.2.1
#使能ARP Snooping功能。
[AC] arp-snooping enable
#配置静态路由。
[AC] ip route-static 202.106.1.0 255.255.255.0 172.16.1.1
#配置WLAN ESS接口。
[AC] interface WLAN-ESS1
[AC-WLAN-ESS1] port access vlan 2
[AC-WLAN-ESS1]quit
#配置service-template服务模板。
[AC] wlan service-template 1 clear
[AC-wlan-st-1] ssid h3c-nat
[AC-wlan-st-1] bind WLAN-ESS 1
[AC-wlan-st-1] service-template enable
[AC-wlan-st-1] quit
#配置ap1。
[AC] wlan ap ap1 model WA2610i-GN
[AC-wlan-ap-ap1] serial-id 219801A0CLC124000294
```

[AC-wlan-ap-ap1] radio 1

[AC- wlan-ap-ap1-radio-1] service-template 1

[AC- wlan-ap-ap1-radio-1] radio enable

[AC- wlan-ap-ap1-radio-1] quit

[AC-wlan-ap-ap1] quit

2．MSR-JiTuan配置：

#配置以太网接口IP地址。

system-view

[MSR-JiTuan] interface Ethernet0/0

[MSR-JiTuan - Ethernet0/0] ip address 172.16.1.1 255.255.255.0

[MSR-JiTuan - Ethernet0/0] quit

[MSR-JiTuan] interface Ethernet0/1

[MSR-JiTuan - Ethernet0/1] ip address 202.106.1.254 255.255.255.0

[MSR-JiTuan - Ethernet0/1] quit

#配置一对一静态地址转换映射

[MSR-JiTuan] nat static 172.16.1.10 202.106.1.253

[MSR-JiTuan] interface Ethernet0/1

[MSR-JiTuan - Ethernet0/1] nat outbound static

[MSR-JiTuan - Ethernet0/1] quit

3．MSR-FenZhi配置：

#切换以太网接口的工作模式，并配置以太网接口及VLAN接口IP地址。

system-view

[MSR-FenZhi] interface GigabitEthernet0/1

[MSR-FenZhi - GigabitEthernet0/1] port link-mode bridge

[MSR-FenZhi - GigabitEthernet0/1] quit

[MSR-FenZhi] interface GigabitEthernet0/0

[MSR-FenZhi - GigabitEthernet0/0] ip address 202.106.1.1 255.255.255.0

[MSR-FenZhi - GigabitEthernet0/0] quit

[MSR-FenZhi] interface Vlan-interface1

[MSR-FenZhi -Vlan-interface1] ip address 192.168.1.1 255.255.255.0

[MSR-FenZhi -Vlan-interface1] quit

#配置DHCP server，并设置option 43 属性，AC地址为202.106.1.253。

[MSR-FenZhi] dhcp enable

[MSR-FenZhi] dhcp server ip-pool ap

[MSR-FenZhi - dhcp server ip-pool ap] network 192.168.1.0 mask 255.255.255.0

[MSR-FenZhi - dhcp server ip-pool ap] gateway-list 192.168.1.1

[MSR-FenZhi - dhcp server ip-pool ap] option 43 hex 80070000 01CA6A01FD

[MSR-FenZhi - dhcp server ip-pool ap] quit

[MSR-FenZhi] dhcp server forbidden-ip 192.168.1.1

#配置访问控制列表2001，仅允许内部网络中192.168.1.0/24网段的用户可以访问Internet。

[MSR-FenZhi] acl number 2001

[MSR-FenZhi -acl-basic-2001] rule 0 permit source 192.168.1.0 0.0.0.255

[MSR-FenZhi -acl-basic-2001] rule 5 deny

[MSR-FenZhi -acl-basic-2001] quit

#配置IP地址池1。

[MSR-FenZhi] nat address-group 1 202.106.1.2 202.106.1.10

在出接口GigabitEthernet0/0上配置ACL 2001与IP地址池1相关联。

[MSR-FenZhi] interface GigabitEthernet0/0

[MSR-FenZhi - GigabitEthernet0/0] nat outbound 2001 address-group 1

[MSR-FenZhi - GigabitEthernet0/0] quit

#配置默认路由。

[MSR-FenZhi] ip route-static 0.0.0.0 0.0.0.0 202.106.1.254

六、结果验证：

（1）查看分支路由器nat会话表项。

```
<MSR-FenZhi>display nat session

There are currently 2 NAT sessions:

Protocol      GlobalAddr  Port      InsideAddr  Port        DestAddr  Port
     UDP     202.106.1.5 12291     192.168.1.3 12222   202.106.1.253 12222
     status:11      TTL:00:04:00   Left:00:03:58   VPN:---

     UDP     202.106.1.5 12288     192.168.1.3 12223   202.106.1.253 12223
     status:11      TTL:00:04:00   Left:00:03:59   VPN:---
```

（2）查看集团路由器nat会话表项。

```
<MSR-JiTuan>display nat session

There are currently 2 NAT sessions:

Pro     GlobalAddr:Port         LocalAddr:Port          DestAddr:Port
UDP     202.106.1.253:12222     172.16.1.10:12222       202.106.1.5:12291
        GlobalVPN: ---          LocalVPN: ---
        status: 9               TTL: 00:04:00           Left: 00:03:58

UDP     202.106.1.253:12223     172.16.1.10:12223       202.106.1.5:12288
        GlobalVPN: ---          LocalVPN: ---
        status: 9               TTL: 00:04:00           Left: 00:03:53
```

（3）查看AP信息。

```
<AC>display wlan ap all
 Total Number of APs configured           : 1
 Total Number of configured APs connected : 1
 Total Number of auto APs connected       : 0
                                AP Profiles
 State : I = Idle,   J = Join, JA = JoinAck,   IL = ImageLoad
         C = Config, R = Run,  KU = KeyUpdate, KC = KeyCfm
--------------------------------------------------------------------------------
 AP Name                        State Model              Serial-ID
--------------------------------------------------------------------------------
 ap1                            R/M   WA2610i-GN         219801A0CLC124000294
--------------------------------------------------------------------------------
```

（5）查看客户端信息。

```
<AC>display wlan client
 Total Number of Clients           : 1
                          Client Information
 SSID: h3c-nat
--------------------------------------------------------------------------------
MAC Address    User Name            APID/RID IP Address                    VLAN
--------------------------------------------------------------------------------
0024-d636-18b2 -NA-                  1   /1   192.168.2.2                   2
```

（6）客户端获取IP地址信息，并能ping通网关。

```
C:\Documents and Settings\w08903>ipconfig

Windows IP Configuration


Ethernet adapter 无线网络连接:

        Connection-specific DNS Suffix  . :
        IP Address. . . . . . . . . . . . : 192.168.2.2
        Subnet Mask . . . . . . . . . . . : 255.255.255.0
        IP Address. . . . . . . . . . . . : fe80::224:d6ff:fe36:18b2%4
        Default Gateway . . . . . . . . . : 192.168.2.1
```

```
C:\Documents and Settings\w08903>ping 192.168.2.1

Pinging 192.168.2.1 with 32 bytes of data:

Reply from 192.168.2.1: bytes=32 time=8ms TTL=255
Reply from 192.168.2.1: bytes=32 time=13ms TTL=255
Reply from 192.168.2.1: bytes=32 time=2ms TTL=255
Reply from 192.168.2.1: bytes=32 time=2ms TTL=255

Ping statistics for 192.168.2.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 13ms, Average = 6ms
```