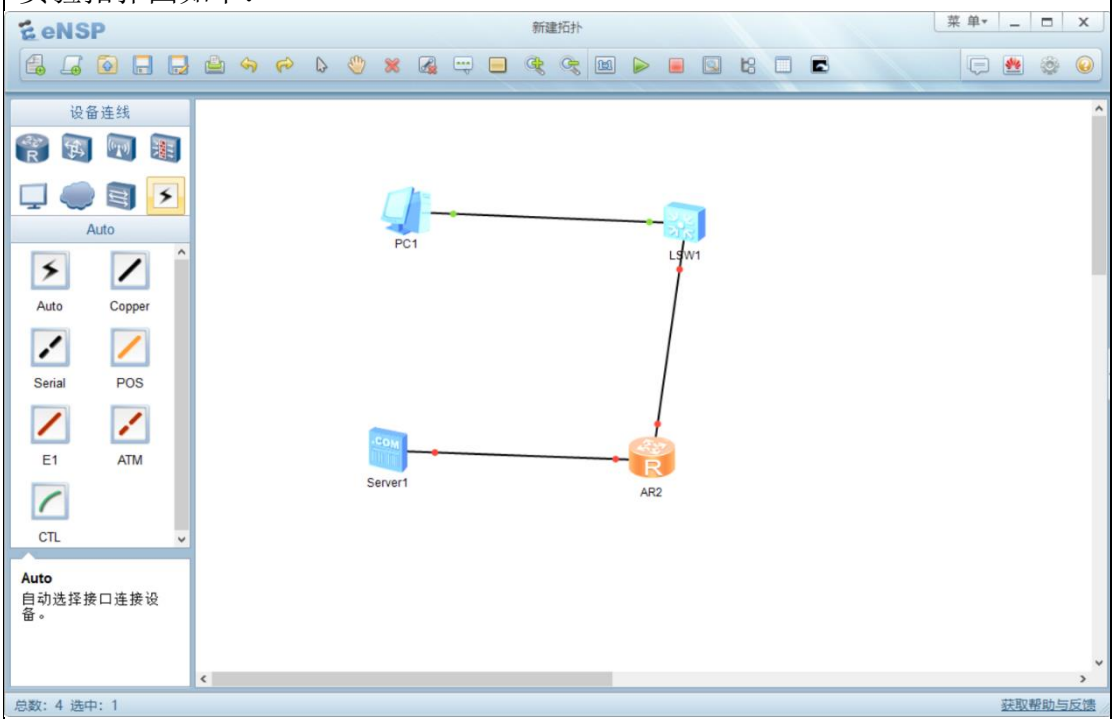
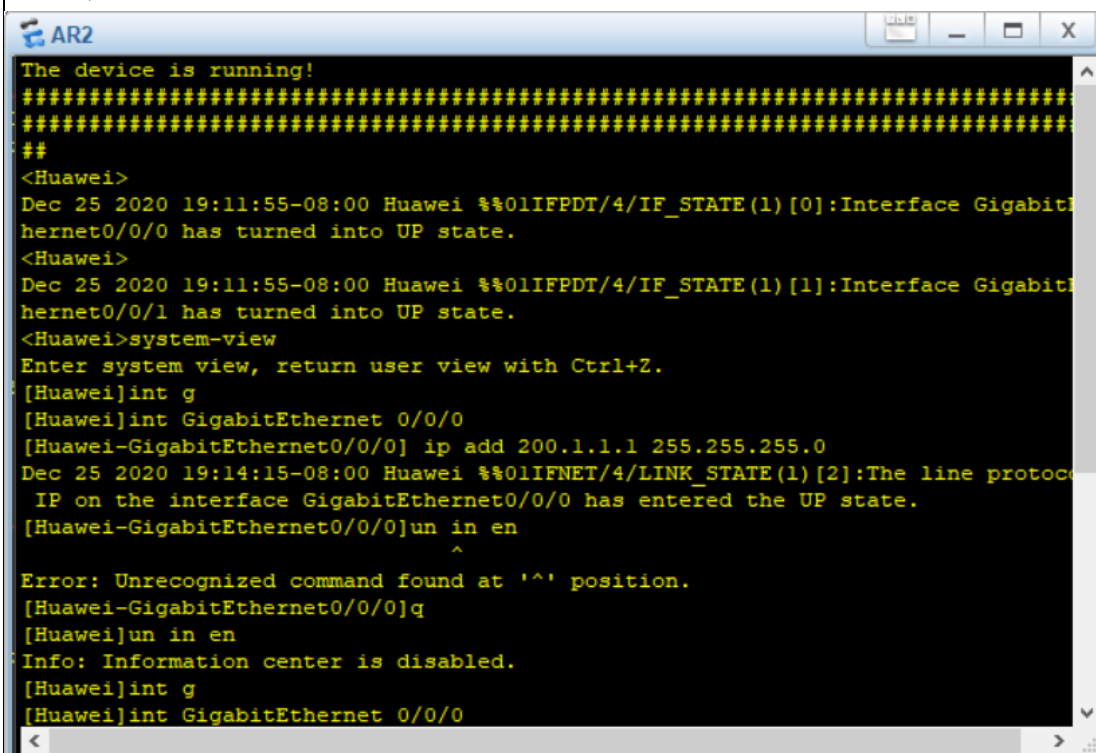


实验名称：配置静态\动态 NAT	
实验台号：	实验时间：
实验小组：张楷	
实验目的： <ul style="list-style-type: none">•配置网络地址变换；•提供到公司共享服务器的可靠外部访问。	
实验环境说明：装有 eNSP 的 PC	
实验拓扑图如下：	
 <p>The screenshot displays the eNSP software interface. On the left, there is a '设备连线' (Device Connection) panel with various icons for devices like PC, Switch, Router, and Server. Below this is an 'Auto' section with options like 'Auto', 'Copper', 'Serial', 'POS', 'E1', 'ATM', and 'CTL'. The main workspace shows a network diagram with four nodes: PC1 (a blue computer icon), LSW1 (a blue switch icon), AR2 (an orange router icon), and Server1 (a blue server icon). The connections are as follows: PC1 is connected to LSW1, LSW1 is connected to AR2, and AR2 is connected to Server1. The status bar at the bottom indicates '总数: 4 选中: 1' (Total: 4, Selected: 1) and a link to '获取帮助与反馈' (Get help and feedback).</p>	
图 1 实验拓扑图	

实验过程、步骤（可另附页、使用网络拓扑图等辅助说明）及结果：

一、静态 NAT 配置

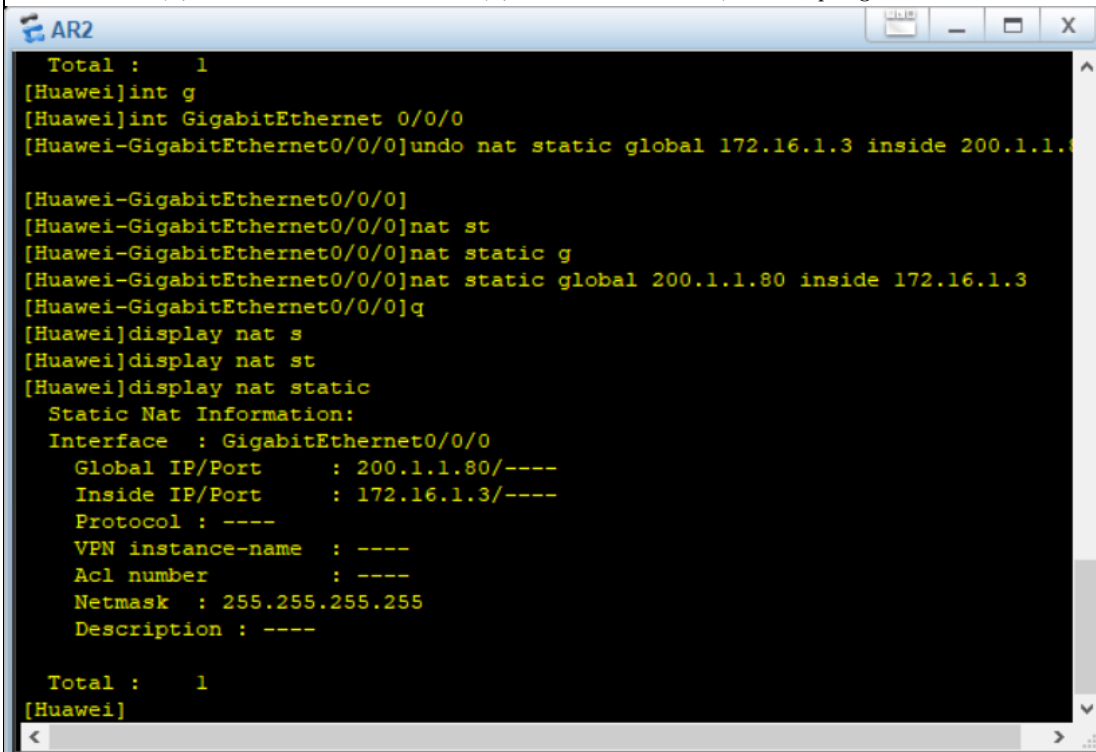
- 1) 将两个端口的网关分别设置为 200.1.1.1 和 172.16.1.1，同时配置默认路由。



```
AR2
The device is running!
#####
#####
##
<Huawei>
Dec 25 2020 19:11:55-08:00 Huawei %01IFPDT/4/IF_STATE(1)[0]:Interface GigabitEthernet0/0/0 has turned into UP state.
<Huawei>
Dec 25 2020 19:11:55-08:00 Huawei %01IFPDT/4/IF_STATE(1)[1]:Interface GigabitEthernet0/0/1 has turned into UP state.
<Huawei>system-view
Enter system view, return user view with Ctrl+Z.
[Huawei]int g
[Huawei]int GigabitEthernet 0/0/0
[Huawei-GigabitEthernet0/0/0] ip add 200.1.1.1 255.255.255.0
Dec 25 2020 19:14:15-08:00 Huawei %01IFNET/4/LINK_STATE(1)[2]:The line protocol IP on the interface GigabitEthernet0/0/0 has entered the UP state.
[Huawei-GigabitEthernet0/0/0]un in en
      ^
Error: Unrecognized command found at '^' position.
[Huawei-GigabitEthernet0/0/0]q
[Huawei]un in en
Info: Information center is disabled.
[Huawei]int g
[Huawei]int GigabitEthernet 0/0/0
```

图 2 配置路由信息

- 2) 在端口 0/0/0, 将 ip 176.16.1.3 分配给 200.1.1.80, 并检查映射表, 如图 3, Global IP 为 200.1.1.80, Inside IP 为 172.16.1.3。此时 PC1 可 ping 通 200.1.1.2。

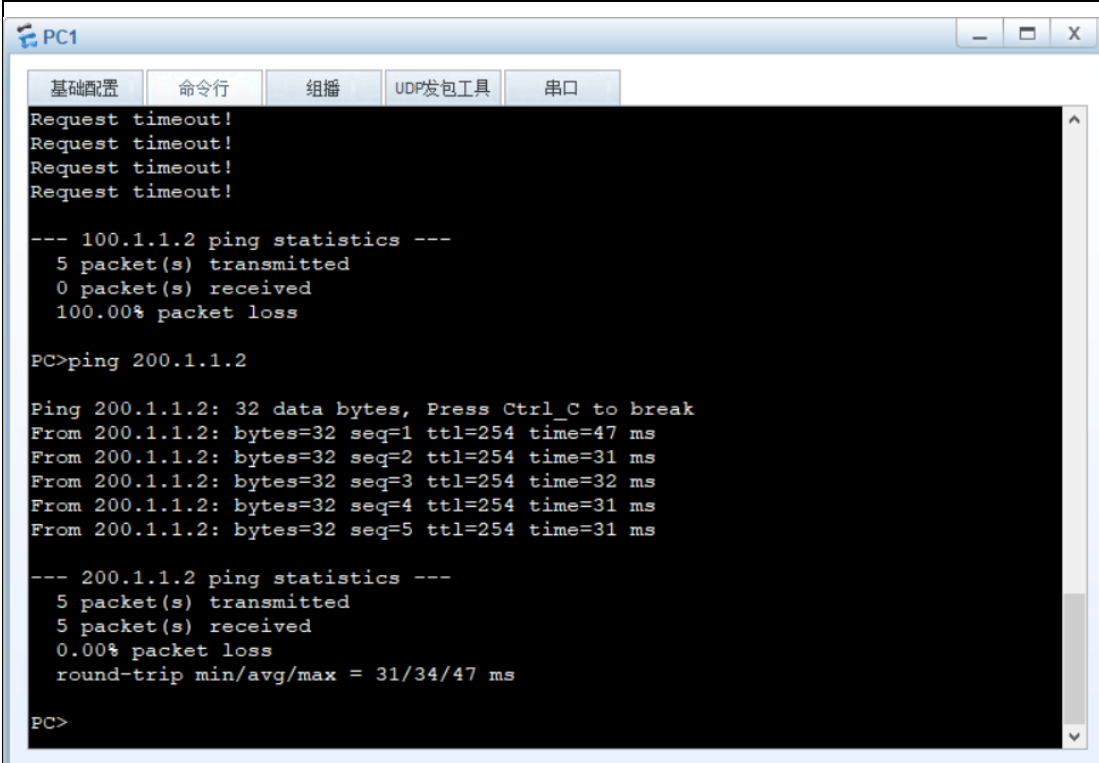


```
AR2
Total : 1
[Huawei]int g
[Huawei]int GigabitEthernet 0/0/0
[Huawei-GigabitEthernet0/0/0]undo nat static global 172.16.1.3 inside 200.1.1.80

[Huawei-GigabitEthernet0/0/0]
[Huawei-GigabitEthernet0/0/0]nat st
[Huawei-GigabitEthernet0/0/0]nat static g
[Huawei-GigabitEthernet0/0/0]nat static global 200.1.1.80 inside 172.16.1.3
[Huawei-GigabitEthernet0/0/0]q
[Huawei]display nat s
[Huawei]display nat st
[Huawei]display nat static
Static Nat Information:
Interface : GigabitEthernet0/0/0
Global IP/Port : 200.1.1.80/----
Inside IP/Port : 172.16.1.3/----
Protocol : ----
VPN instance-name : ----
Acl number : ----
Netmask : 255.255.255.255
Description : ----

Total : 1
[Huawei]
```

图 3 配置静态 NAT

A screenshot of a PC1 command window. The window has a title bar with 'PC1' and standard minimize, maximize, and close buttons. Below the title bar are five tabs: '基础配置' (Basic Configuration), '命令行' (Command Line), '组播' (Multicast), 'UDP发包工具' (UDP Packet Tool), and '串口' (Serial Port). The '命令行' tab is active, showing a black background with white text. The text displays the results of a ping command from 100.1.1.2 to 200.1.1.2. It shows four 'Request timeout!' messages, followed by a summary for 100.1.1.2: 5 packets transmitted, 0 received, 100% loss. Then, the user enters 'PC>ping 200.1.1.2'. The output shows five successful pings with 32 bytes, TTL=254, and times between 31ms and 47ms. A second summary for 200.1.1.2 shows 5 packets transmitted and received, 0% loss, and a round-trip time range of 31/34/47 ms. The prompt 'PC>' is visible at the bottom.

```
Request timeout!
Request timeout!
Request timeout!
Request timeout!

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

PC>ping 200.1.1.2

Ping 200.1.1.2: 32 data bytes, Press Ctrl_C to break
From 200.1.1.2: bytes=32 seq=1 ttl=254 time=47 ms
From 200.1.1.2: bytes=32 seq=2 ttl=254 time=31 ms
From 200.1.1.2: bytes=32 seq=3 ttl=254 time=32 ms
From 200.1.1.2: bytes=32 seq=4 ttl=254 time=31 ms
From 200.1.1.2: bytes=32 seq=5 ttl=254 time=31 ms

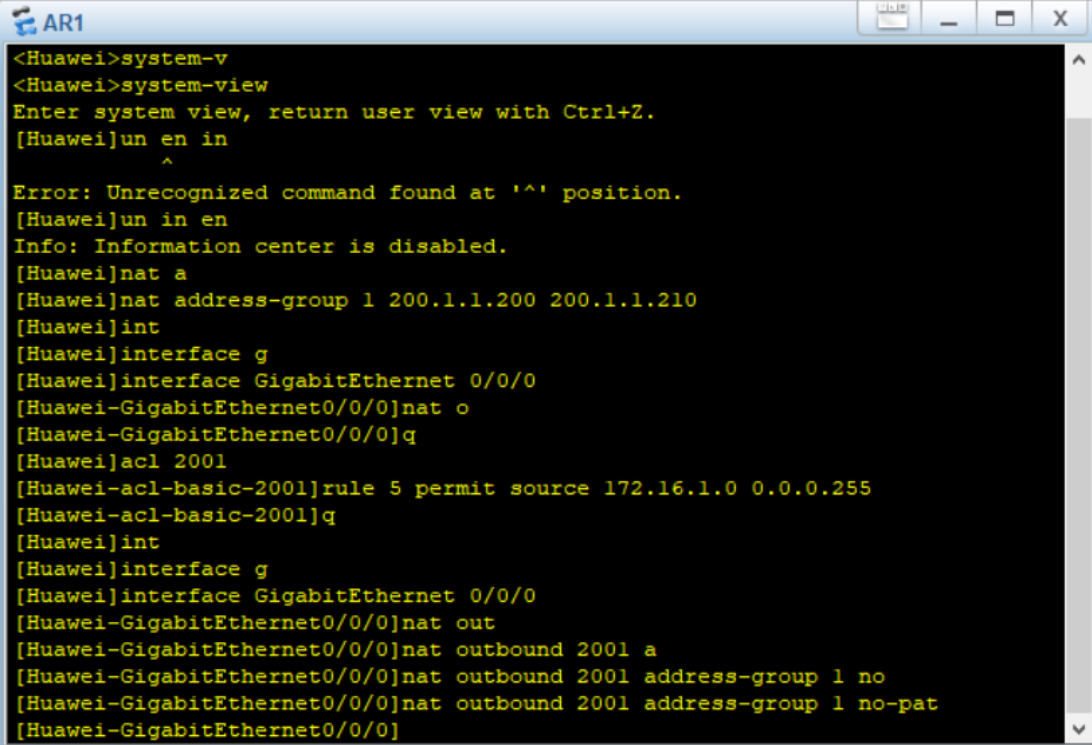
--- 200.1.1.2 ping statistics ---
  5 packet(s) transmitted
  5 packet(s) received
  0.00% packet loss
 round-trip min/avg/max = 31/34/47 ms

PC>
```

图 4 ping

二、 动态 NAT 配置

在 AR1 中，首先通过 nat address-group 1 200.1.1.200 200.1.1.210 建立地址池，设置 ACL 控制。

A screenshot of an AR1 command window. The window has a title bar with 'AR1' and standard minimize, maximize, and close buttons. Below the title bar are three tabs: '基础配置' (Basic Configuration), '命令行' (Command Line), and '组播' (Multicast). The '命令行' tab is active, showing a black background with white text. The text displays the configuration steps for dynamic NAT on a Huawei device. It starts with entering system view, then user view, and back to system view. An error message is shown for an unrecognized command. Then, an address group 'a' is created with IP range 200.1.1.200 to 200.1.1.210. Next, an ACL named '2001' is configured to permit traffic from 172.16.1.0/24. Finally, NAT is configured on GigabitEthernet 0/0/0, including an outbound rule 'a' and two outbound rules for address group '1' (one with 'no-pat'). The configuration ends with the prompt '[Huawei-GigabitEthernet0/0/0]'.

```
<Huawei>system-v
<Huawei>system-view
Enter system view, return user view with Ctrl+Z.
[Huawei]un en in
      ^
Error: Unrecognized command found at '^' position.
[Huawei]un in en
Info: Information center is disabled.
[Huawei]nat a
[Huawei]nat address-group 1 200.1.1.200 200.1.1.210
[Huawei]int
[Huawei]interface g
[Huawei]interface GigabitEthernet 0/0/0
[Huawei-GigabitEthernet0/0/0]nat o
[Huawei-GigabitEthernet0/0/0]q
[Huawei]acl 2001
[Huawei-acl-basic-2001]rule 5 permit source 172.16.1.0 0.0.0.255
[Huawei-acl-basic-2001]q
[Huawei]int
[Huawei]interface g
[Huawei]interface GigabitEthernet 0/0/0
[Huawei-GigabitEthernet0/0/0]nat out
[Huawei-GigabitEthernet0/0/0]nat outbound 2001 a
[Huawei-GigabitEthernet0/0/0]nat outbound 2001 address-group 1 no
[Huawei-GigabitEthernet0/0/0]nat outbound 2001 address-group 1 no-pat
[Huawei-GigabitEthernet0/0/0]
```

图 5NAT 动态分配

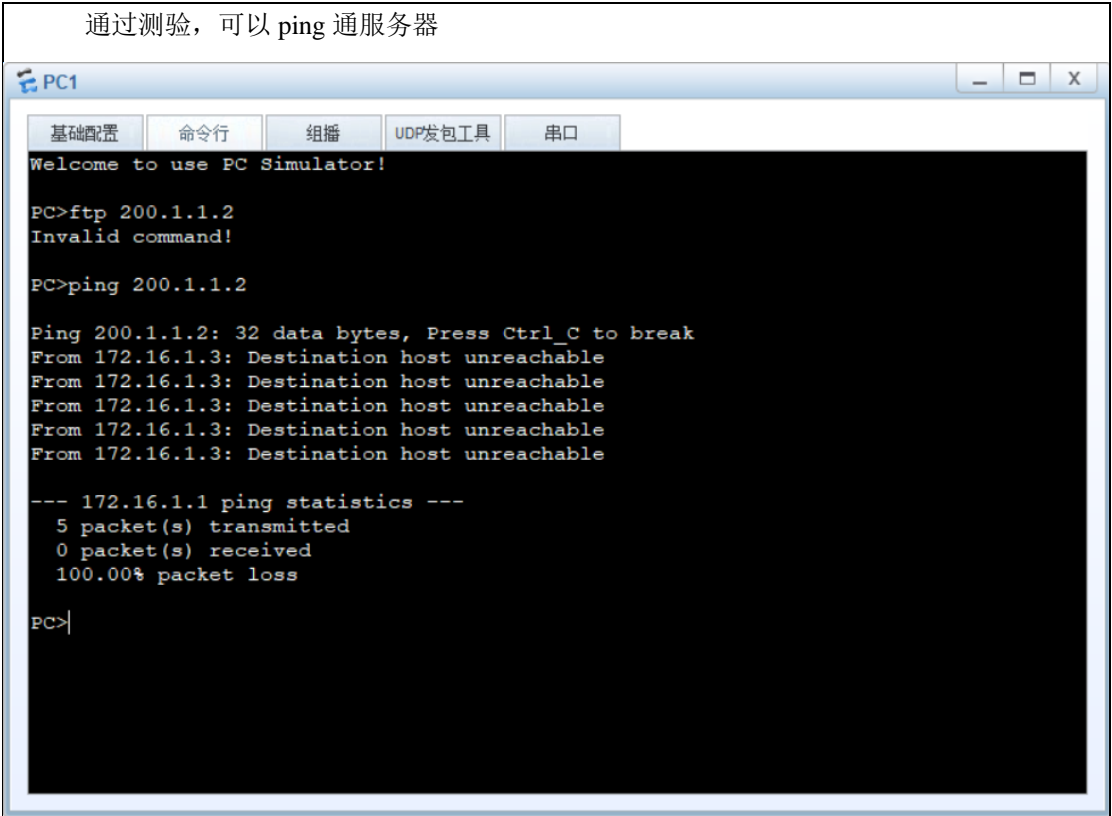


图 6 测试

实验总结（遇到的问题及解决办法、体会）：了解了 NAT 的使用	
器材、工具领用及归还负责人：张楷	实验记录人：（签名）张楷
实验执笔人：（签名）张楷	报告协助人：（签名）张楷
小组成员签名：（签名） 张楷	
验收人：	成绩评定：