实验三 子网划分和NAT配置

1. 实验目的

1.熟练配置静态多子网网络环境

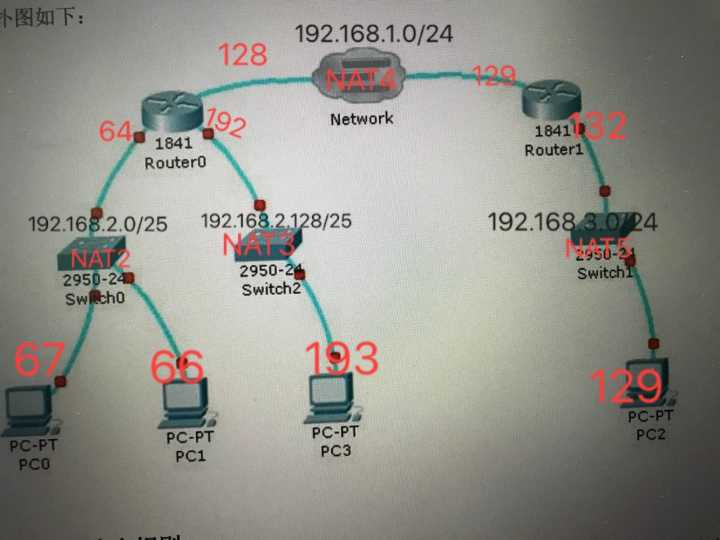
2.理解子网划分的概念

3.学会NAT组网方式

4.为之后的实验对组网的要求打下基础

1. 网络拓扑配置

|  |  |  |  |
| --- | --- | --- | --- |
| 节点名 | 虚拟设备名 | ip | netmask |
| Router0 | Router0 | ens33:192.168.2.64 | 255.255.255.128 |
| ens38:192.168.2.192 | 255.255.255.128 |
| ens39:192.168.1.128 | 255.255.255.0 |
| Route1 | Router1 | ens33:192.168.1.129 | 255.255.255.0 |
| ens38:192.168.3.132 | 255.255.255.0 |
| PC0 | PC0 | 192.168.2.67 | 255.255.255.128 |
| PC1 | PC1 | 192.168.2.66 | 255.255.255.128 |
| PC2 | PC2 | 192.168.3.129 | 255.255.255.0 |
| PC3 | PC3 | 192.168.2.193 | 255.255.255.128 |



1. 路由规则配置

Route0：

sudo ip route add 192.168.3.0/24 via 192.168.1.129

sudo su

echo 1 > /proc/sys/net/ipv4/ip\_forward

exit

Route1：

sudo ip route add 192.168.2.0/24 via 192.168.1.128

sudo su

echo 1 > /proc/sys/net/ipv4/ip\_forward

exit

1. NAT设置命令

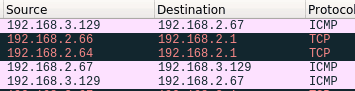
Route0：

sudo iptables -t nat -A POSTROUTING -o ens39 -s 192.168.2.0/24 -j SNAT –to 192.168.1.128

1. 数据包截图：

（1）设置NAT前

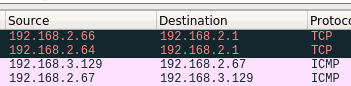
PC0 PING PC2



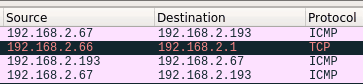
PC0 PING PC3

![C:\Users\吴紫航\Documents\Tencent Files\401986905\Image\C2C\`(1}L2M([HX](]W)HN%]%1M.png](data:image/png;base64,)

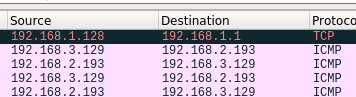
PC2 PING PC0



PC3 PING PC0



PC2 PING PC3



PC3 PING PC2

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(2)设置NAT后

PC0 PING PC2



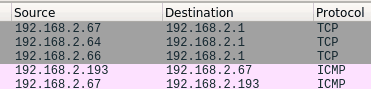
PC0 PING PC3



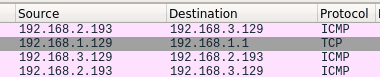
PC3 PING PC2

C:\Users\吴紫航\Documents\Tencent Files\401986905\Image\C2C\L01I7NUX{WE27VP{SOM_UBO.png

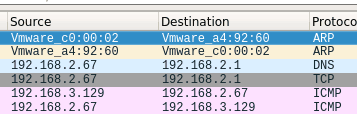
PC3 PING PC0



PC2 PING PC3



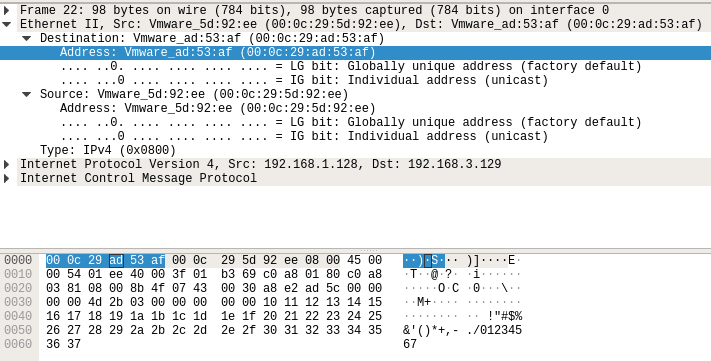
PC2 PING PC0



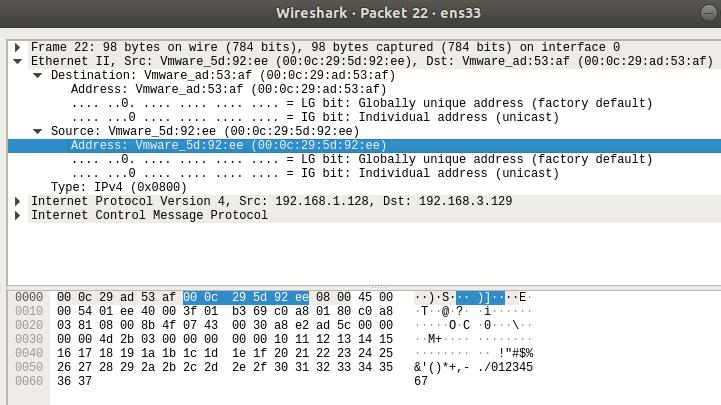
1. 协议报文分析

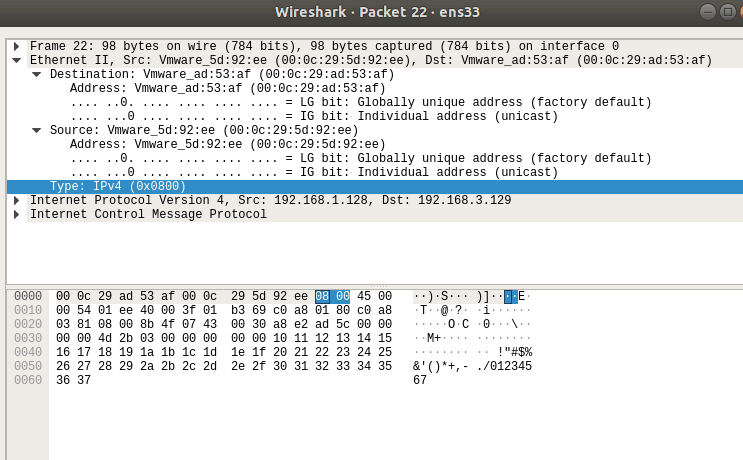
Nat设置前的报文分析和实验一相同，现对nat设置后pc0 ping pc2的icmp request包进行字段分析

目标mac地址为00：0c:29:ad:53:af

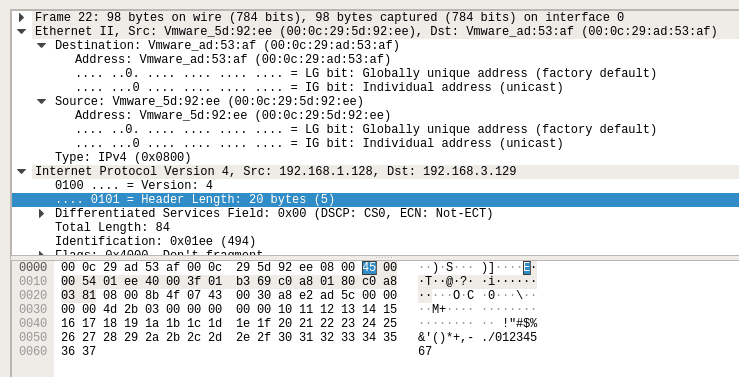


源mac地址：00：0c:29:5d:92:ee

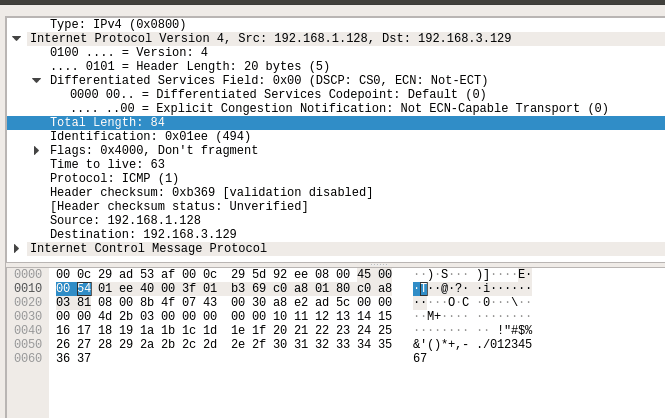


类型ipv4  


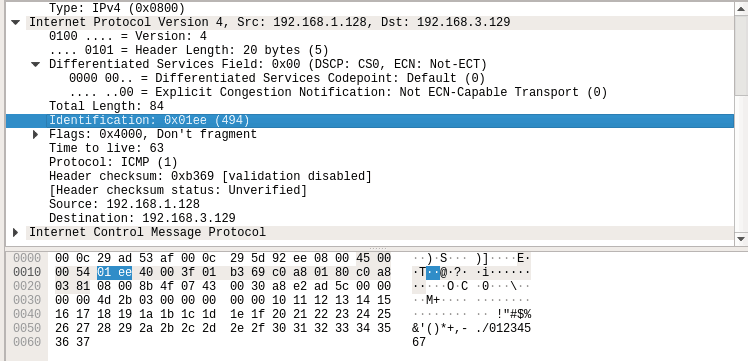
Ip版本4，头长20bytes



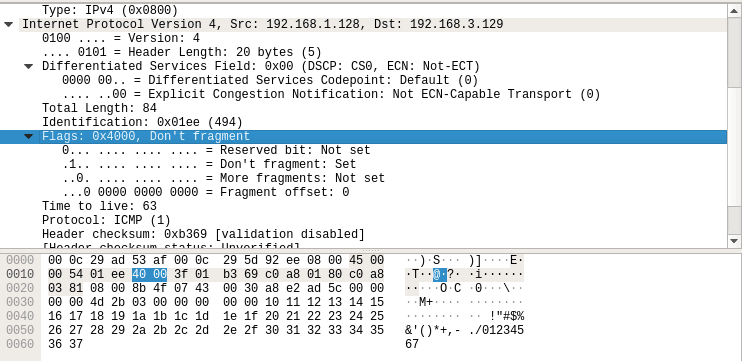
Ip包总长84bytes

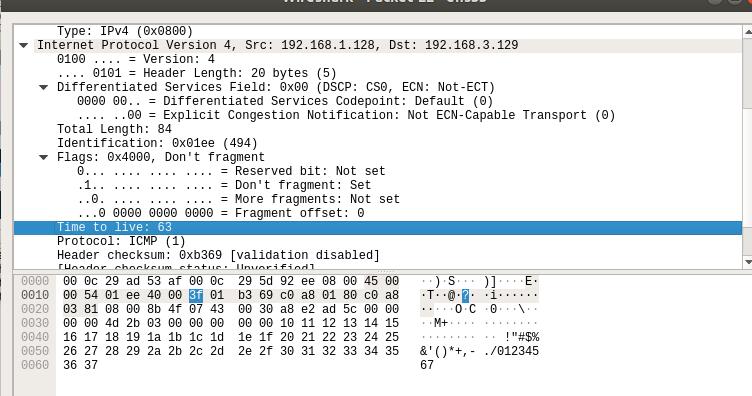


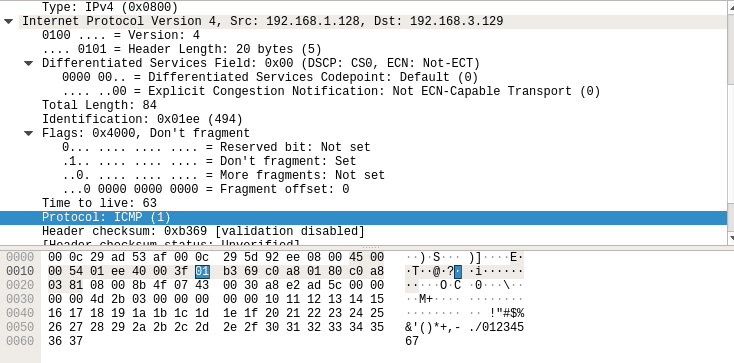
验证码494

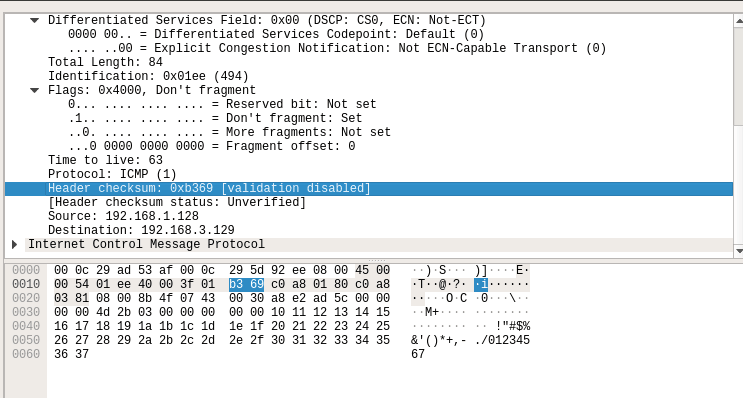


不分块

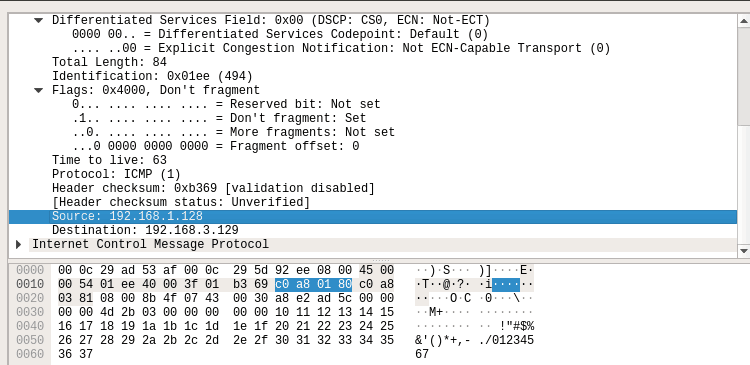


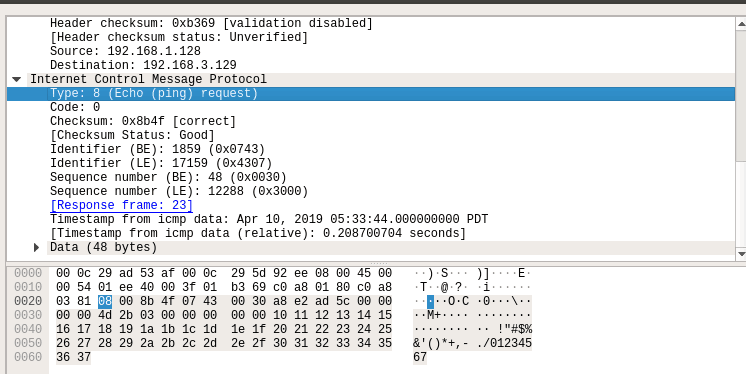
生存期63  


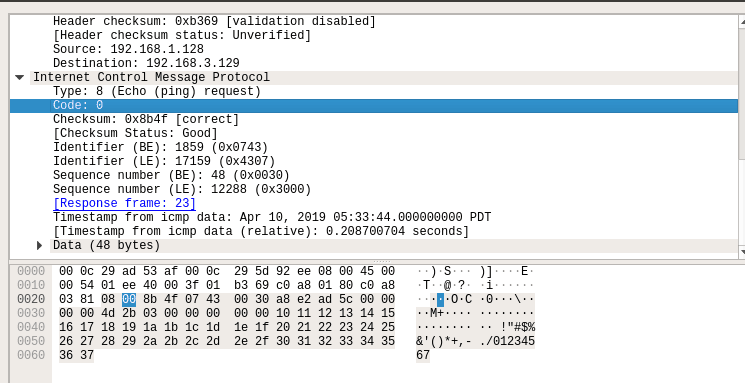
协议为icmp协议  


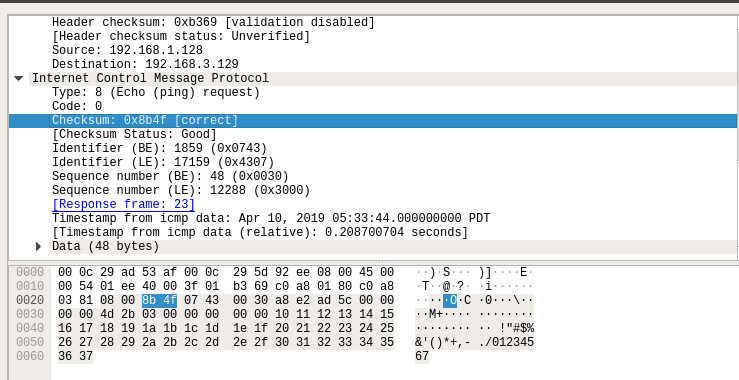
校验和为0xb369  


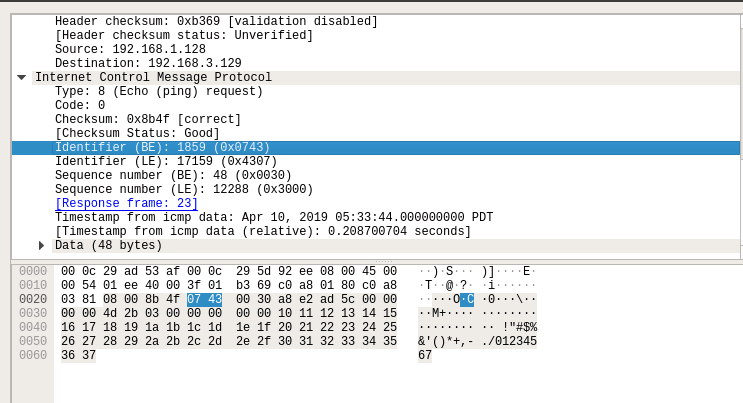
源ip:192.168.1.128(nat转换后的ip)

目的ip：192.168.3.129  


Icmp类型为request  


编码为0  


校验和为0x8b4f  
  
验证码为BE:0X0743 LE:0X4307

序列号为BE:0X0030 LE:0X3000  


数据段为0x4d2b03…3637  
