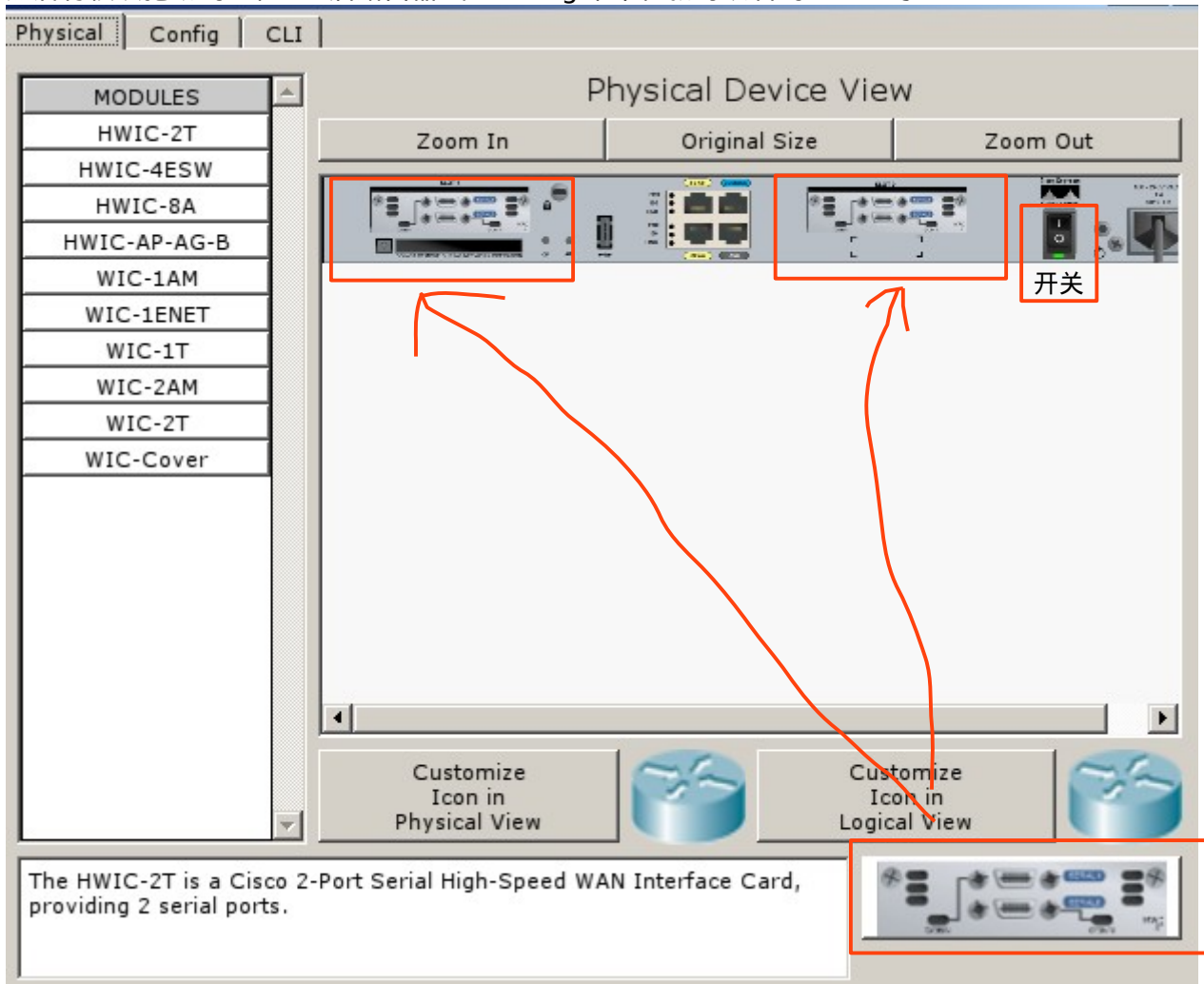


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需要注意，路由器需要使用串口，而默认情况下串口是没有的，所以要添加该模块。首先关闭路由器。然后将模块拖动到空位。重启路由器。在 config 菜单栏就可以看到 serial 了。



3. 配置 console\enable\telnet 密码

```
router1(config)#line console 0
router1(config-line)#password console
router1(config-line)#login
router1(config-line)#enable secret enable
router1(config)#enable secret enable
router1(config)#line vty 0 4
router1(config-line)#password telnet
router1(config-line)#login
```

配置 console 密码

配置特权模式密码

配置 telnet 方式登录密码

User Access Verification

Password:

```
router1>enable
Password:
router1#
```

退出后再次登录，需要先输入 console 密码，再输入 enable 密码。

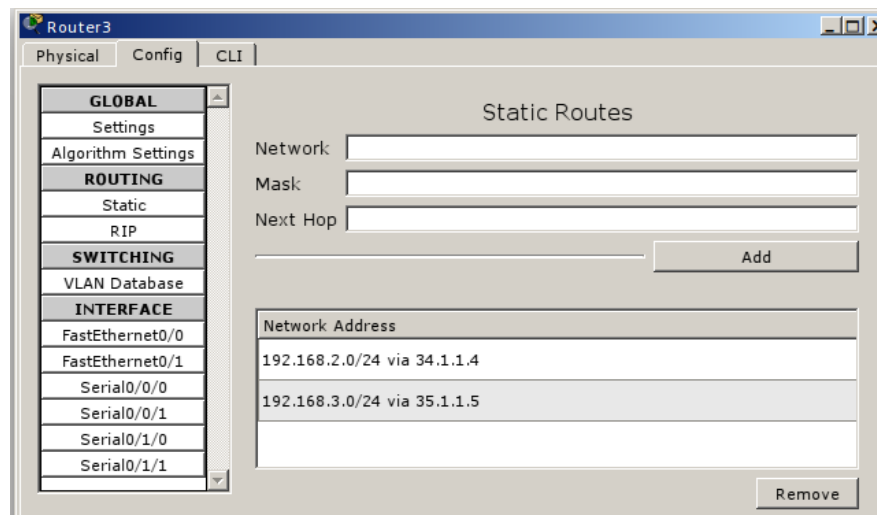
如果配置泄漏的话，不需要重改设置。因为在设置特权模式密码的时候，用的是“enable secret xxx”，在存储密码时会加密，所以比用“enable password xxx”安全。

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4. 南方子公司间网络连通

配置 Router3 上的静态路由

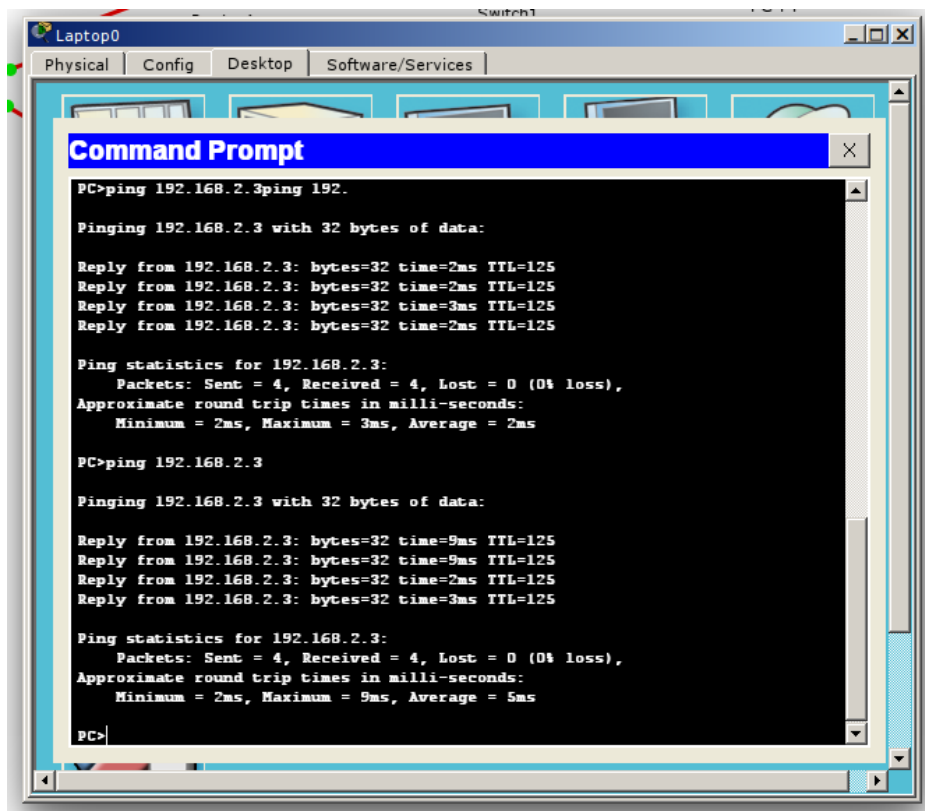


router4 静态路由

Network Address
192.168.2.0/24 via 35.1.1.3

router5 静态路由

Network Address
192.168.3.0/24 via 34.1.1.3



laptop0 和 pc1
ping 通了!

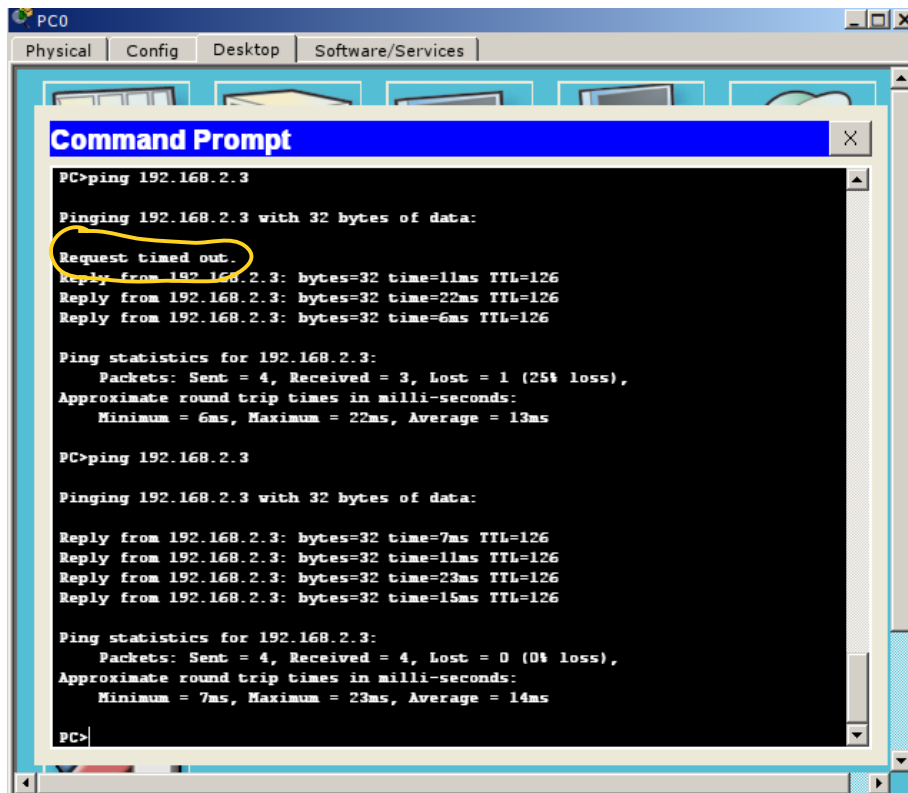
5. 使用 IPsec vpn 跨越公网

重大问题：虽然现在两个子公司可以互联，但是现在在公网路由器 Router3 上配置了私网的静态路由。

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2016 秋季 ✕ 40240572 ✕ 主讲：尹霞

PC0 ping PC1 (北京-南京)



The screenshot shows a Windows XP desktop environment with a window titled 'PC0'. Inside the window, there is a 'Command Prompt' application. The command prompt shows the execution of the command 'ping 192.168.2.3'. The output indicates that the first ping request timed out, while the subsequent three replies were successful. The ping statistics show 4 packets sent, 3 received, and 1 lost (25% loss). The approximate round trip times in milliseconds are: Minimum = 6ms, Maximum = 22ms, Average = 13ms. The second ping attempt shows all four packets received successfully, with round trip times ranging from 7ms to 23ms, and an average of 14ms.

```
PC>ping 192.168.2.3

Pinging 192.168.2.3 with 32 bytes of data:
Request timed out.
Reply from 192.168.2.3: bytes=32 time=11ms TTL=126
Reply from 192.168.2.3: bytes=32 time=22ms TTL=126
Reply from 192.168.2.3: bytes=32 time=6ms TTL=126

Ping statistics for 192.168.2.3:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 6ms, Maximum = 22ms, Average = 13ms

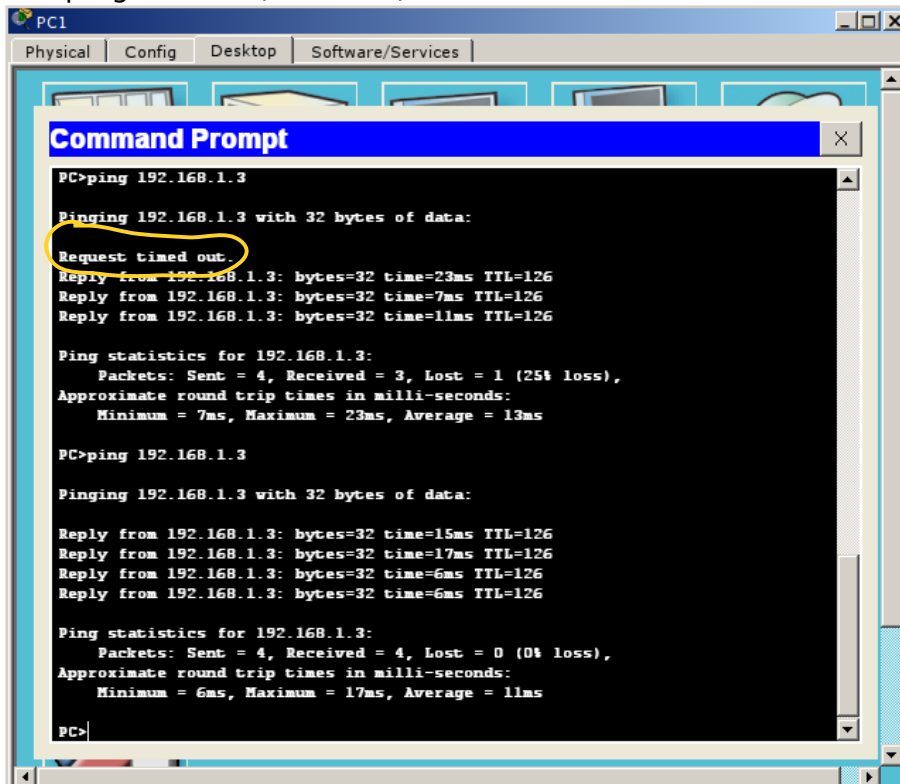
PC>ping 192.168.2.3

Pinging 192.168.2.3 with 32 bytes of data:
Reply from 192.168.2.3: bytes=32 time=7ms TTL=126
Reply from 192.168.2.3: bytes=32 time=11ms TTL=126
Reply from 192.168.2.3: bytes=32 time=23ms TTL=126
Reply from 192.168.2.3: bytes=32 time=15ms TTL=126

Ping statistics for 192.168.2.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 7ms, Maximum = 23ms, Average = 14ms

PC>
```

PC1 ping Server0(南京-北京)



The screenshot shows a Windows XP desktop environment with a window titled 'PC1'. Inside the window, there is a 'Command Prompt' application. The command prompt shows the execution of the command 'ping 192.168.1.3'. The output indicates that the first ping request timed out, while the subsequent three replies were successful. The ping statistics show 4 packets sent, 3 received, and 1 lost (25% loss). The approximate round trip times in milliseconds are: Minimum = 7ms, Maximum = 23ms, Average = 13ms. The second ping attempt shows all four packets received successfully, with round trip times ranging from 6ms to 17ms, and an average of 11ms.

```
PC>ping 192.168.1.3

Pinging 192.168.1.3 with 32 bytes of data:
Request timed out.
Reply from 192.168.1.3: bytes=32 time=23ms TTL=126
Reply from 192.168.1.3: bytes=32 time=7ms TTL=126
Reply from 192.168.1.3: bytes=32 time=11ms TTL=126

Ping statistics for 192.168.1.3:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 7ms, Maximum = 23ms, Average = 13ms

PC>ping 192.168.1.3

Pinging 192.168.1.3 with 32 bytes of data:
Reply from 192.168.1.3: bytes=32 time=15ms TTL=126
Reply from 192.168.1.3: bytes=32 time=17ms TTL=126
Reply from 192.168.1.3: bytes=32 time=6ms TTL=126
Reply from 192.168.1.3: bytes=32 time=6ms TTL=126

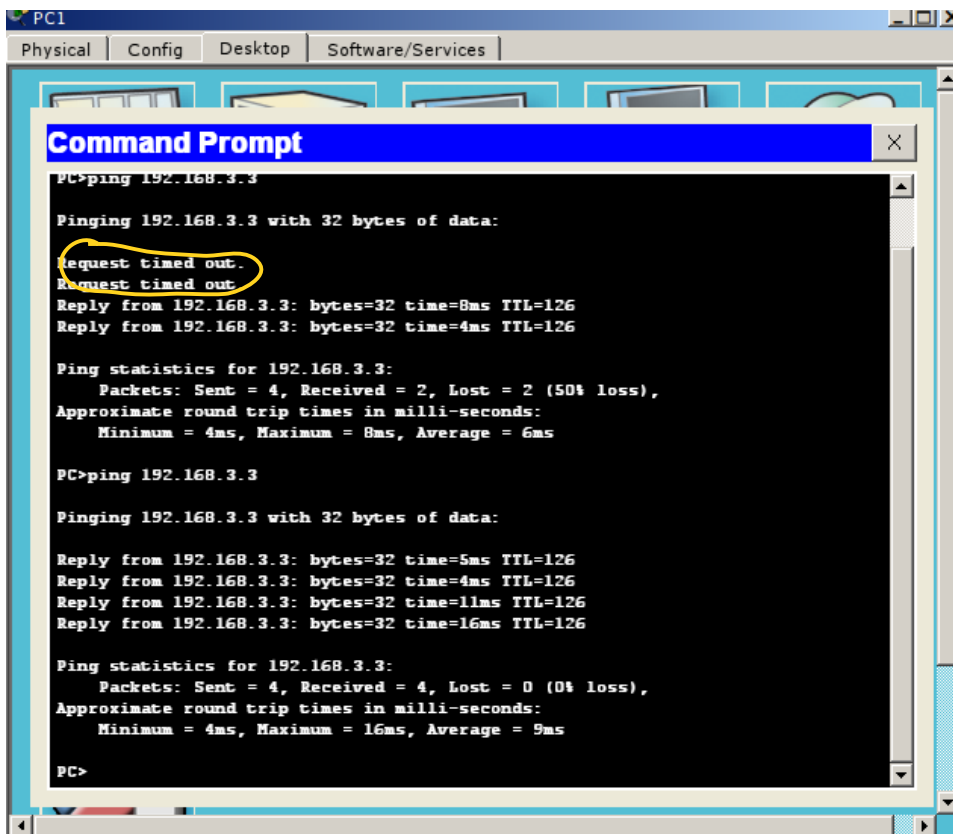
Ping statistics for 192.168.1.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 6ms, Maximum = 17ms, Average = 11ms

PC>
```

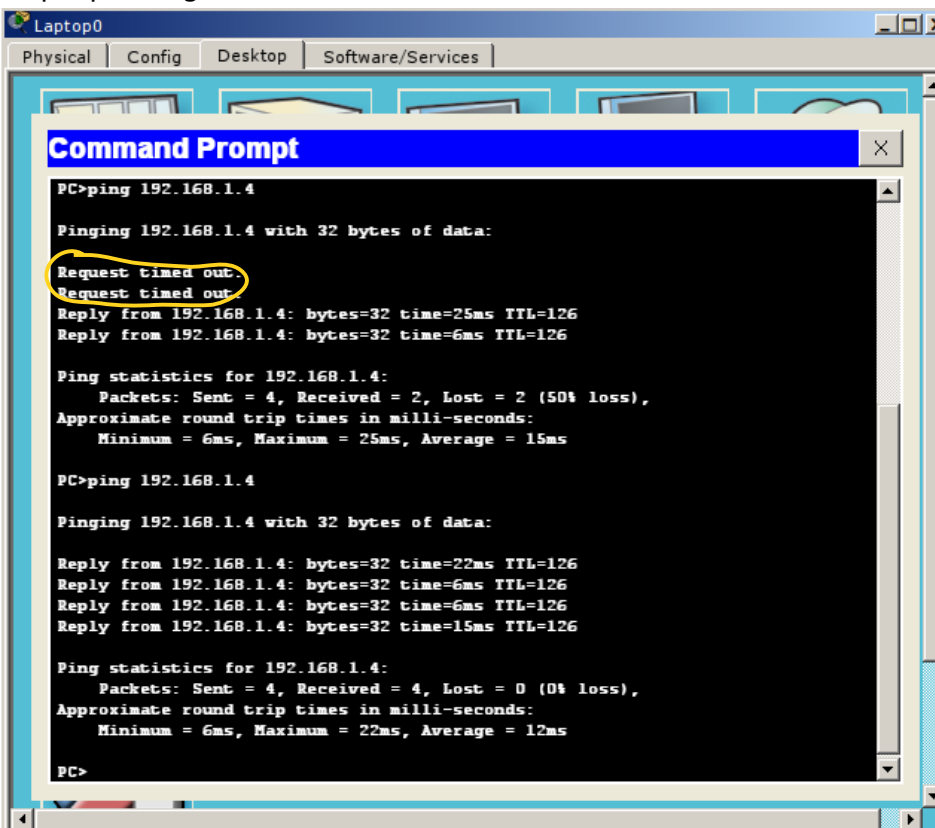
PC1 ping Laptop0(南京-上海)

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Laptop0 Ping PC0(上海-北京)



看到图中会丢失前两个包, 是因为正在建立 IPSec 协商.

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各个路由器的配置如下：

Router1:

```
crypto isakmp policy 1
```

```
hash md5
```

```
authentication pre-share
```

```
crypto isakmp key hello address 34.1.1.4
```

```
crypto isakmp key hello address 35.1.1.5
```

```
crypto ipsec transform-set testtag ah-sha-hmac esp-des
```

```
crypto map test 10 ipsec-isakmp
```

```
set peer 34.1.1.4
```

```
set transform-set testtag
```

```
match address 101
```

```
crypto map test 11 ipsec-isakmp
```

```
set peer 35.1.1.5
```

```
set transform-set testtag
```

```
match address 102
```

```
interface FastEthernet0/0
```

```
ip address 192.168.1.1 255.255.255.0
```

```
duplex auto
```

```
speed auto
```

```
interface Serial0/0/0
```

```
ip address 12.1.1.1 255.255.255.0
```

```
clock rate 2000000
```

```
crypto map test
```

```
ip route 0.0.0.0 0.0.0.0 12.1.1.2
```

```
access-list 101 permit ip 192.168.1.0 0.0.0.255 192.168.2.0 0.0.0.255
```

```
access-list 102 permit ip 192.168.1.0 0.0.0.255 192.168.3.0 0.0.0.255
```

Router2

```
interface Serial0/0/0
```

```
ip address 12.1.1.2 255.255.255.0
```

```
interface Serial0/0/1
```

```
ip address 23.1.1.2 255.255.255.0
```

```
clock rate 2000000
```

```
ip route 34.1.1.0 255.255.255.0 23.1.1.3
```

```
ip route 35.1.1.0 255.255.255.0 23.1.1.3
```

```
ip route 12.1.1.0 255.255.255.0 12.1.1.1
```

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Router3

```
interface Serial0/0/1
ip address 23.1.1.3 255.255.255.0

interface Serial0/1/0
ip address 34.1.1.3 255.255.255.0

interface Serial0/1/1
ip address 35.1.1.3 255.255.255.0

ip route 34.1.1.0 255.255.255.0 34.1.1.4
ip route 35.1.1.0 255.255.255.0 35.1.1.5
ip route 12.1.1.0 255.255.255.0 23.1.1.2
```

Router4

```
crypto isakmp policy 1
hash md5
authentication pre-share

crypto isakmp key hello address 12.1.1.1
crypto isakmp key hello1 address 35.1.1.5

crypto ipsec transform-set testtag ah-sha-hmac esp-des

crypto map test 10 ipsec-isakmp
set peer 12.1.1.1
set transform-set testtag
match address 101

crypto map test 11 ipsec-isakmp
set peer 35.1.1.5
set transform-set testtag
match address 102

interface FastEthernet0/0
ip address 192.168.2.1 255.255.255.0
duplex auto
speed auto

interface Serial0/0/0
ip address 34.1.1.4 255.255.255.0
clock rate 2000000
crypto map test

ip route 0.0.0.0 0.0.0.0 34.1.1.3
```

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```
access-list 102 permit ip 192.168.2.0 0.0.0.255 192.168.3.0 0.0.0.255
access-list 101 permit ip 192.168.2.0 0.0.0.255 192.168.1.0 0.0.0.255
```

Router5

```
crypto isakmp policy 1
hash md5
authentication pre-share
```

```
crypto isakmp key hello address 12.1.1.1
crypto isakmp key hello1 address 34.1.1.4
```

```
crypto ipsec transform-set testtag ah-sha-hmac esp-des
```

```
crypto map test 10 ipsec-isakmp
set peer 12.1.1.1
set transform-set testtag
match address 101
```

```
crypto map test 11 ipsec-isakmp
set peer 34.1.1.4
set transform-set testtag
match address 102
```

```
interface FastEthernet0/0
ip address 192.168.3.1 255.255.255.0
duplex auto
speed auto
```

```
interface Serial0/0/0
ip address 35.1.1.5 255.255.255.0
clock rate 2000000
crypto map test
```

```
ip route 0.0.0.0 0.0.0.0 35.1.1.3
```

```
access-list 102 permit ip 192.168.3.0 0.0.0.255 192.168.2.0 0.0.0.255
access-list 101 permit ip 192.168.3.0 0.0.0.255 192.168.1.0 0.0.0.255
```

六.辞退小王

网络拓扑结构如下图.

其中 PC0 为我的电脑, ip 地址为 192.168.1.4

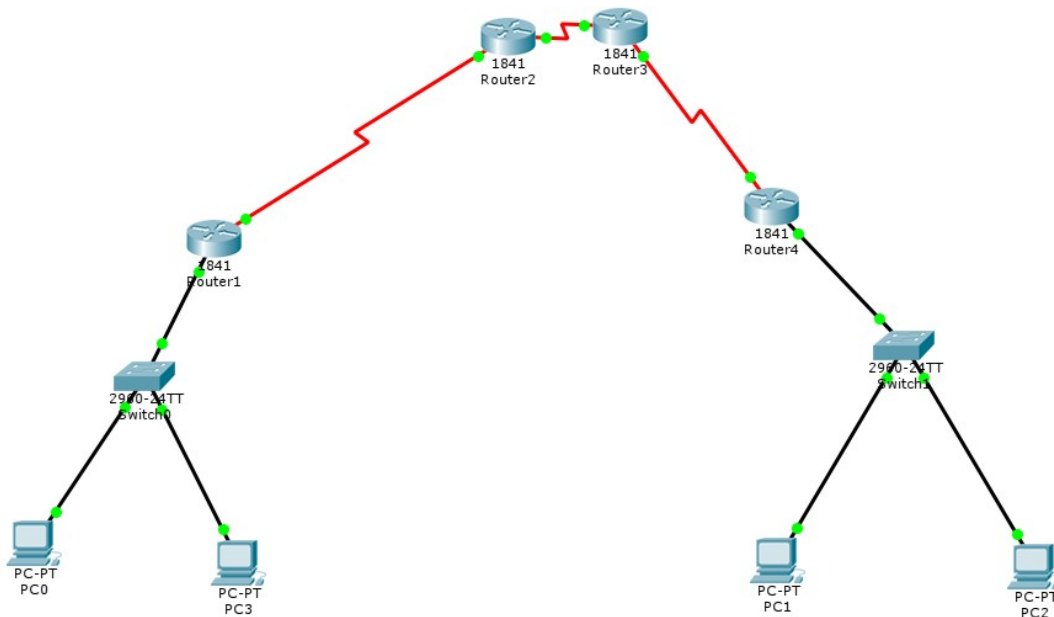
PC3 为某台电脑, ip 地址为 192.168.1.5

PC1 为小王电脑, ip 地址为 192.168.2.3

PC2 为小李电脑, ip 地址为 192.168.2.4

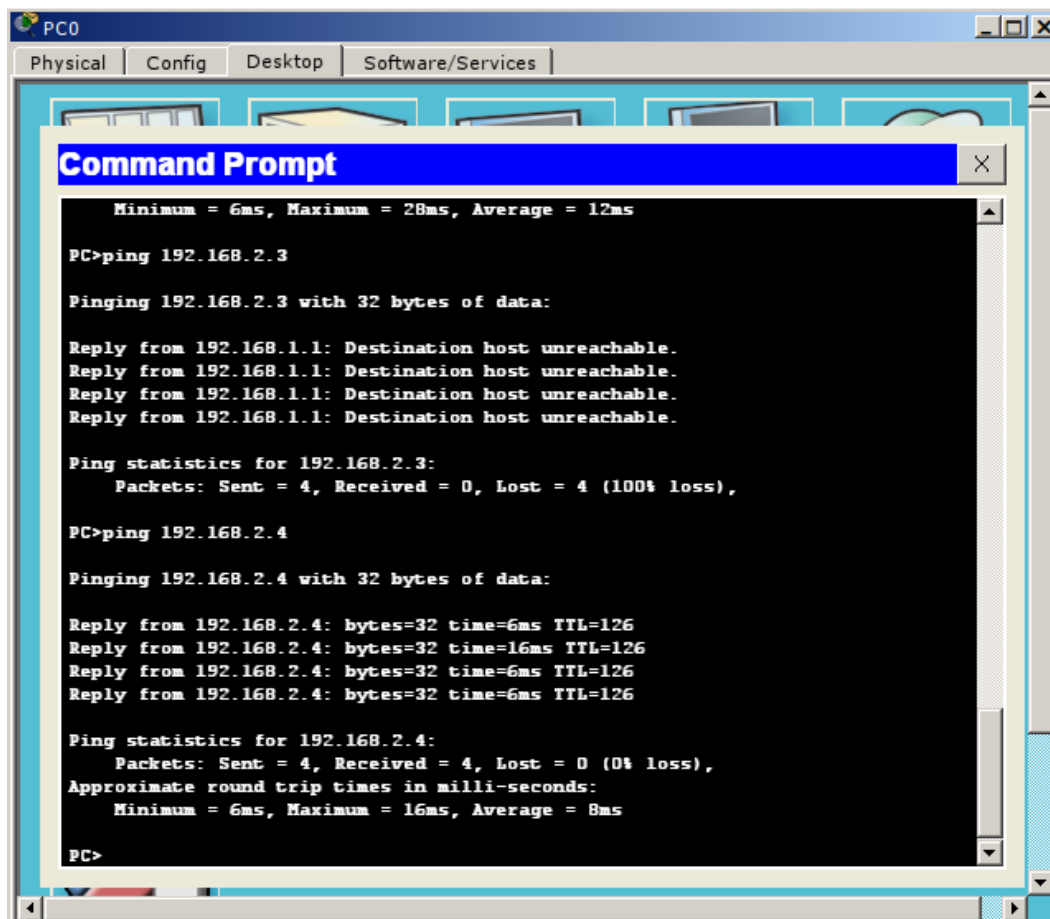
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测试结果

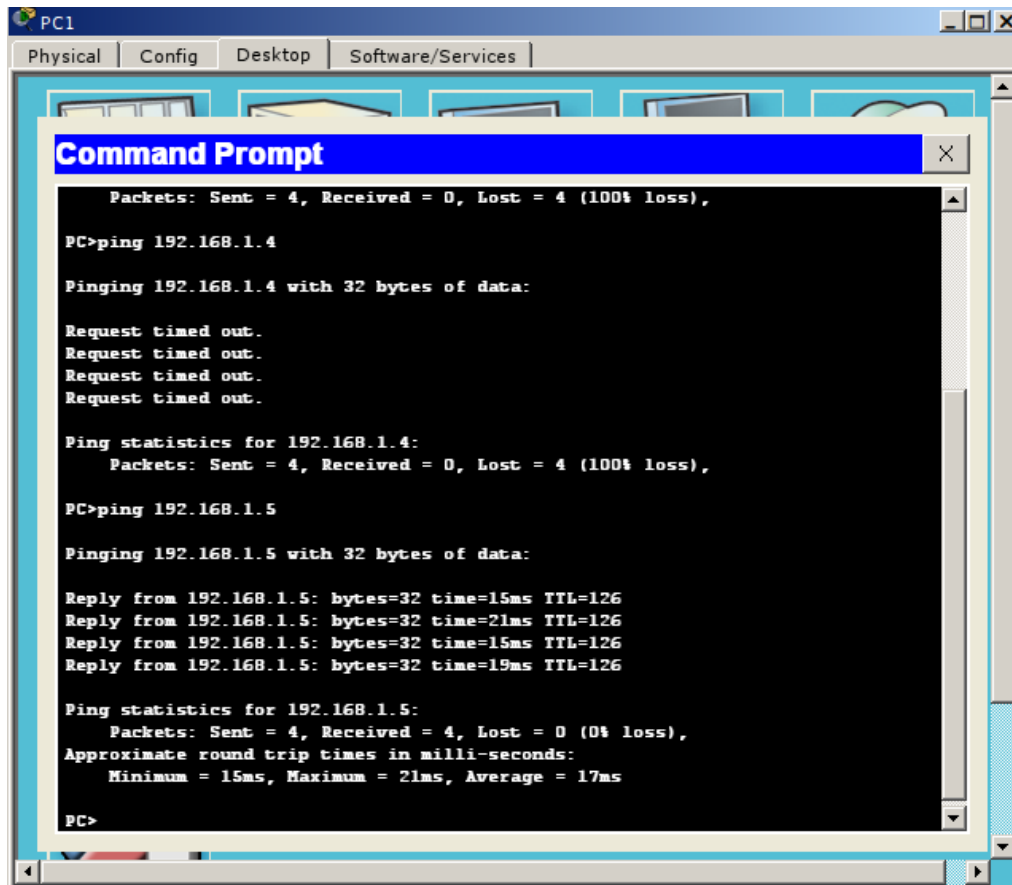
PC0(192.168.1.4)与 PC1(小王电脑 192.168.2.3)不连通, 与 PC2(小李电脑 192.168.2.4)连通



《计算机网络安全技术》第三次课后作业

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PC1(小王电脑 192.168.2.3)与 PC0(我的电脑 192.168.1.4)不连通，与 PC3(某台电脑 192.168.1.5)连通



实现方法为给路由器 Router1 加上 ACL.

```
access-list 103 deny ip host 192.168.1.4 host 192.168.2.3
access-list 103 permit ip any any
```

```
interface Serial0/0/0
ip address 12.1.1.1 255.255.255.0
ip access-group 103 in
ip access-group 103 out
clock rate 2000000
```