

## 实验四十二、VPN（L2TP/PPTP）的配置

### 一、 实验目的

1. 掌握二层协议建立 VPN 的配置
2. 理解 L2TP 与 PPTP 原理

### 二、 应用环境

L2TP 和 PPTP 为移动用户和分支机构连入总部提供了安全保证。

### 三、 实验设备

1. DCR-1751 一台
2. PC 机 一台

### 四、 实验拓扑



### 五、 实验要求

配置表

#### Router-A

S1/1	192.168.1.1/24
F0/0	192.168.0.0/24

#### Router-B

S1/0	192.168.1.2/24
F0/0	192.168.2.1/24

结果：

在路由器 A 与 B 之间建立 VPN，保护从 A 到 B 的数据

### 六、 实验步骤

第一步：参照实验三和上表配置接口地址并测试连通性

第二步：路由器 A 的配置

Router-A#conf

```
Router-A_config#int virtual-tunnel 0
Router-A_config_vn0#ip address 172.16.1.2 255.255.255.0
Router-A_config_vn0#ppp chap host test@dcn.net
Router-A_config_vn0#ppp chap password 1234
Router-A_config_vn0#exit
Router-A_config#vpdn enable
Router-A_config#vpdn-group 0
Router-A_config_vpdn#request-dialin
Router-A_config_vpdn#initiate-to ip 192.168.1.2 priority 1
Router-A_config_vpdn#protocol l2tp
Router-A_config_vpdn#domain dcn.net
Router-A_config_vn0#exit
Router-A_config#ip route 192.168.2.0 255.255.255.0 virtual-tunnel 0
```

第三步: 查看路由器 A 的配置

```
Router-A#sh l2tp tunnel
L2TP Tunnel Information:
No active tunnels
```

```
Router-A#sh l2tp session
L2TP Session Information:
No active sessions
```

```
Router-A#sh int virtual-tunnel 0
Virtual-tunnel0 is up, line protocol is down
  Hardware is Unknown device
  Interface address is 172.16.1.2/24
  MTU 1500 bytes, BW 100000 kbit, DLY 10000 usec
  Encapsulation PPP, loopback not set
  Keepalive set(10 sec)
  LCP  Listening -- waiting for remote host to attempt open
  IPCP Listening -- waiting for remote host to attempt open
    local IP address: 172.16.1.2  remote IP address: 0.0.0.
```

第四步: 路由器 B 的配置

```
Router-B#conf
Router-B_config#user test@dcn.net password 0 1234
Router-B_config#ip local pool l2tppool 172.16.1.10 10
Router-B_config#int virtual-template 0
Router-B_config_vt0#ip address 172.16.1.1 255.255.255.0
Router-B_config_vt0#ppp authen chap
Router-B_config_vt0#peer default ip address pool l2tppool
Router-B_config_vt0#exit
Router-B_config#vpdn enable
```

```
Router-B_config#vpdn-group 0
Router-B_config_vpdn#accept-dialin
Router-B_config_vpdn#protocol l2tp
Router-B_config_vpdn#lcp-renegotiation
Router-B_config_vpdn#virtual-template 0
Router-B_config_vpdn#exit
Router-B_config#ip route 192.168.0.0 255.255.255.0 171.16.1.2
Router-B_config#^Z
```

第五步: 查看 B 的配置

```
Router-B# sh run
```

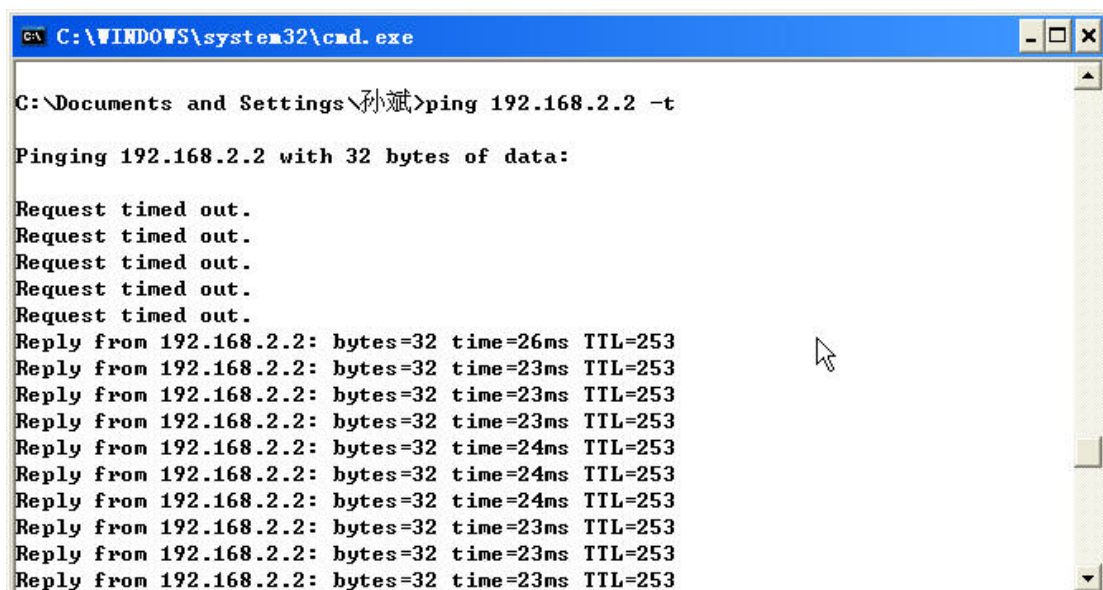
Building configuration...

Current configuration:

```
!
!version 1.3.2E
service timestamps log date
service timestamps debug date
no service password-encryption
!
hostname Router-B
!
ip host a 192.168.1.1
ip host c 192.168.2.2
!
!
!
!
ip local pool l2tppool 172.16.1.10 10
!
username test@dcn.net password 0 1234
!
!
!
interface Virtual-template0
 ip address 172.16.1.1 255.255.255.0
 no ip directed-broadcast
 ppp authentication chap
 peer default ip address pool l2tppool
!
interface FastEthernet0/0
 ip address 192.168.2.1 255.255.255.0
 no ip directed-broadcast
!
```

```
interface Serial1/0
 ip address 192.168.1.2 255.255.255.0
 no ip directed-broadcast
!
interface Async0/0
 no ip address
 no ip directed-broadcast
!
!
!
!
ip route 192.168.0.0 255.255.255.0 171.16.1.2
!
!
!
!
!
!
!
!
!
!
vpdn enable
!
vpdn-group 0
 accept-dialin
 lcp-renegotiation
 protocol l2tp
 local-name Digitalchina
 virtual-template 0
```

#### 第五步：测试



```
C:\WINDOWS\system32\cmd.exe

C:\Documents and Settings\孙斌>ping 192.168.2.2 -t

Pinging 192.168.2.2 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Reply from 192.168.2.2: bytes=32 time=26ms TTL=253
Reply from 192.168.2.2: bytes=32 time=23ms TTL=253
Reply from 192.168.2.2: bytes=32 time=23ms TTL=253
Reply from 192.168.2.2: bytes=32 time=23ms TTL=253
Reply from 192.168.2.2: bytes=32 time=24ms TTL=253
Reply from 192.168.2.2: bytes=32 time=24ms TTL=253
Reply from 192.168.2.2: bytes=32 time=24ms TTL=253
Reply from 192.168.2.2: bytes=32 time=23ms TTL=253
Reply from 192.168.2.2: bytes=32 time=23ms TTL=253
Reply from 192.168.2.2: bytes=32 time=23ms TTL=253
```

## 七、 注意事项和排错

1. 注意两端参数要一致
2. ACL 的作用是确定哪些数据需要经过 VPN
3. 密钥要交叉对应

## 八、 配置序列

Router-A#sh run

Building configuration...

Current configuration:

```
!  
!version 1.3.2E  
service timestamps log date  
service timestamps debug date  
no service password-encryption  
!  
hostname Router-A  
!  
!  
!  
!  
!  
!  
!  
interface Virtual-tunnel0  
 ip address 172.16.1.2 255.255.255.0  
 no ip directed-broadcast  
 ppp chap hostname test@dcn.net  
 ppp chap password 1234  
!  
interface FastEthernet0/0  
 ip address 192.168.0.1 255.255.255.0  
 no ip directed-broadcast  
!  
interface Serial1/0  
 no ip address  
 no ip directed-broadcast  
 physical-layer speed 64000  
!  
interface Serial1/1  
 ip address 192.168.1.1 255.255.255.0
```

## 九、 共同思考

1. LNS 与 LAC 有什么关系?
2. Virtual-tunnel 的作用是什么?

## 十、课后练习

请将协议改为 PPTP 重复以上实验

## 十一、 相关命令详解