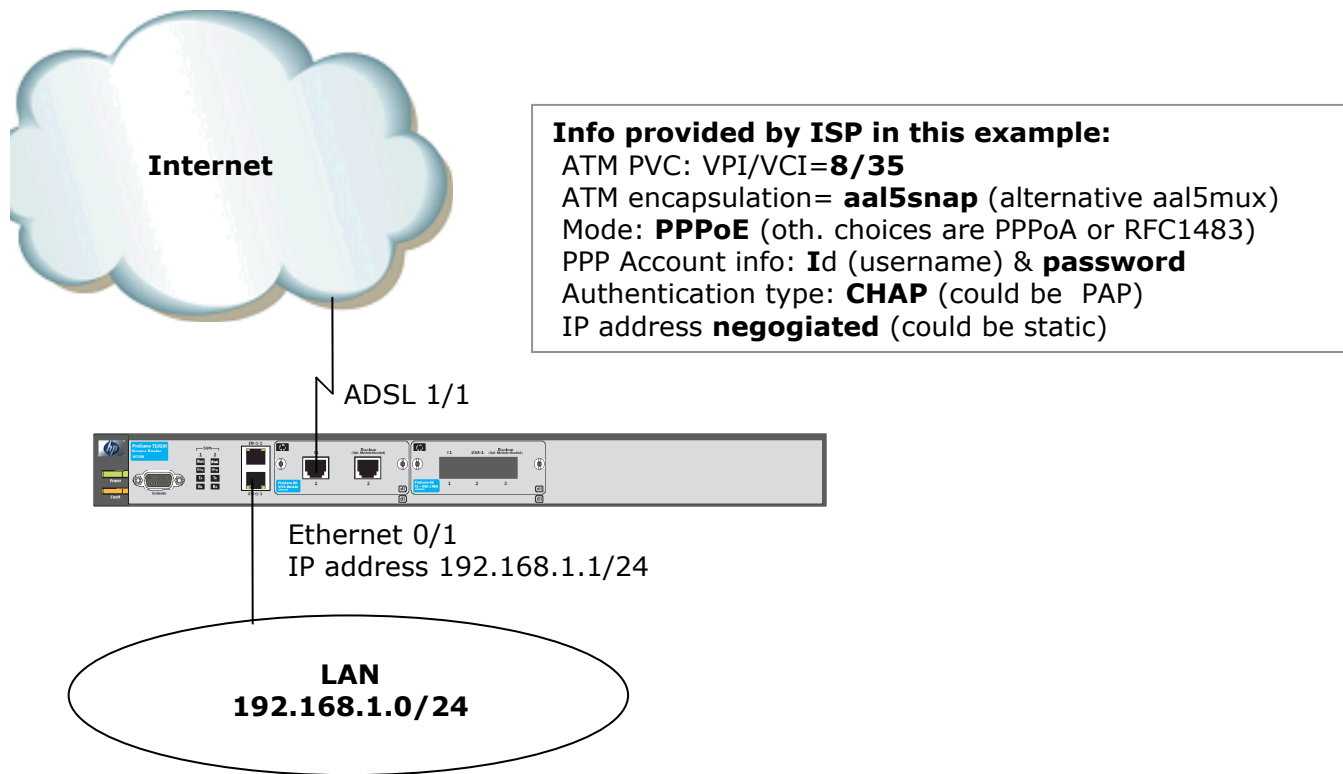


ADSL connection uses PPPOE mode

Configuration example of the HP Procurve 7000 dl Secure Router



The Secure Router is directly connected to the ADSL interface

Note that multiple layers are implied:

- Layer 1 (Physical) is ADSL (int **ADSL 1/1**)
- Layer 2 (Link Layer) is ATM (int **ATM 1**). We bind it to ADSL 1
- Layer 2-1 On top of ATM, the adaptation layer (AAL5MUX or AAL5SNAP) define how frames are converted into ATM cells.

In ATM, data is sent on a Permanent Virtual Circuit (PVC) defined with

its **VPI / VCI**. The PVC is bound to the Point to point ATM sub-interface named **ATM 1.1**

- Layer 2-2 is the PPP Layer, defined in logical interface **PPP 1** that used **PPPOE mode**.

We bind the PPP 1 interface to the ATM 1.1

- Layer 3 is IP

Note: once an IP address and a password have been setup, most of this configuration can easily be created using the Web interface and its Firewall wizard. To beginners it will ease configuration, to experts it will speed the configuration process.

A- ADSL-PPPoE configuration

```
hostname "ADSL-Router"
```

```
ip routing
```

Enable Firewall

```
! Enable Firewall — Requires defining Access Policy
! Access Policy defines NAT and Filters
ip firewall
```

DNS proxy

```
! On a LAN with no DNS servers, we can define the router as a proxy DNS. It acts
! as a DNS server for the DHCP clients. It gets the DNS servers definition from
! the ISP during PPP negotiation.
```

```
ip domain-proxy
ip domain-name "yourprovider.com"
```

DHCP Server for LAN

```
! Define DHCP service for the LAN in the 192.168.1.0 range
```

```
ip dhcp-server pool "pool-for-lan"
network 192.168.1.0 255.255.255.0
```

```
! The provider gives following info
```

```
domain-name "wanadoo.fr"
dns-server 192.168.1.1
netbios-node-type h-node
default-router 192.168.1.1
lease 1
```

The LAN Interface.

```
interface eth 0/1
ip address 192.168.1.1 255.255.255.0
! Inbound traffic from the LAN is NATed as defined in the Access-policy FROM-LAN
access-policy FROM-LAN
no shutdown
```

```
interface eth 0/2
no ip address
shutdown
```

The WAN physical interface = ADSL

```
interface adsl 1/1
! ADSL interface auto detects the ADSL mode: G.dmt, G-LITE, T1.413...
training-mode multi-mode
no shutdown
```

ATM is the encapsulation of the ADSL interface

```
! Traffic is sent in cells
interface atm 1 point-to-point
no shutdown
! We bind ATM interface (logical) to ADSL interface (physical)
! Note that encapsulation is aal5snap by default. The other choice is aal5mux
! Your provider must provide this info
bind 1 adsl 1/1 atm 1
```

ATM PVC (Permanent Virtual Circuit)

```
! ATM cells are transmitted over a PVC.
! The PVC is defined in a point to point ATM sub-interface
interface atm 1.1 point-to-point
    no shutdown
! Provider tells you what VPI/VCI (id of the PVC) to use.
! You can't guess but you can find on Internet other examples of config
    pvc 8/35
    no ip address
```

PPP interface

```
interface ppp 1
! The ip address is negotiated via PPP with provider's router
! As on a PC connection, router gets DNS servers info and IP of concentrator
    ip address negotiated
    no fair-queue
! Authentication: credentials are sent using PAP or CHAP
! For PAP, use ppp pap sent-username... command
! If you don't know what protocol to use, chose either PAP or CHAP and start
! "debug ppp authentication" to check what is required by ISP
    ppp chap hostname id-given-by-isp
    ppp chap password pw-given-by-isp
    no shutdown

! We bind the ppp interface to the ATM 1.1 specifying we're in PPPoE mode
    bind 2 atm 1.1 ppp 1 pppoe-client
```

ACL defines the traffic to be NATed

```
ip access-list extended lan-acl
    remark used for Nat
    permit ip 192.168.1.0 0.0.0.255 any
```

Policy-class

```
! It translates the Private IP source addresses (NAT) of the traffic
! of the LAN into the Public IP address of the PPP interface
ip policy-class FROM-LAN
    nat source list lan-acl interface ppp 1 overload

(skip)

end
```

B- Check the status of the configuration

```
! Note the ADSL interface is UP and the ADSL type is G.DMT.
! Note the downstream and upstream rates of the ADSL interface
```

ADSL-Router#show int adsl 1/1

adsl 1/1 is **UP**, line protocol is **UP**
Link Status Up G.DMT
Line Type Interleave
Line Length 10218 ft

	Downstream	Upstream
Line Rate	608 kbps	160 kbps
Current margin	31.0 dB	31.0 dB
Attenuation	38.0 dB	24.0 dB
Power	17 dBm	11 dBm
Prev Rate	0 kbps	0 kbps
Actual Delay	4 msec	4 msec
Loss of Framing Seconds	0	0
Loss of Signal Seconds	0	0
Loss of Power Seconds	0	0
Errored Seconds	0	1
Line Inits	1	N/A
Rx Blocks	3630763	3630763
Tx Blocks	3630763	3630763
Corrected Blocks	4	7619536
UncorrectedBlocks	0	4
Last Failure	NONE	
Last Failure Time	N/A	

DMT Bits Per Bin

000: 0 0 0 0 0 0 0 0 2 2 2 3 4 4 4 4
010: 4 4 4 4 4 4 4 4 3 3 2 2 2 2 0 0
020: 0 0 0 0 0 0 2 2 2 2 2 2 2 2 2 2
030: 2 2 2 3 3 3 3 3 3 2 2 2 2 2 2 2
040: 0 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
050: 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
060: 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
070: 2 2 2 2 2 2 0 2 2 3 3 3 2 2 2 2
080: 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
090: 2 2 2 0 0 2 2 2 2 2 0 0 0 2 2 0
0A0: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0B0: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0C0: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0D0: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0E0: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0F0: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

! Note ATM interface is UP and one VCC (virtual circuit) is active

ADSL-Router#show int atm 1

atm 1 is **UP**, line protocol is **UP**

BW 160 Kbit/s

16 maximum active VCCs, 16 VCCs per VP, **1 current VCCs**

Queueing strategy: Per VC Queueing

5 minute input rate 33512 bits/sec, 0 packets/sec

5 minute output rate 3040 bits/sec, 0 packets/sec

69444 packets input, 62104316 bytes

0 pkts discarded, 0 error pkts, 0 unknown protocol pkts

1326184 cells received, 0 OAM cells received

51607 packets output, 5003320 bytes

0 tx pkts discarded, 0 tx error pkts

128792 cells sent, 0 OAM cells sent

! Note ATM 1.1 sub-interface is Active, encapsulation Is AAL5 SNAP
! Note packets and celll input and output on interface

ADSL-Router#show int atm 1.1

atm 1.1 is Active

ATM Routed Bridge Encapsulation: None
Encapsulation is **AAL5**
Encapsulation method is **SNAP**
VC tx ring limit: 2
Output Queue: 0/14/200/0 (size/highest/max total/drops)
69452 packets input, 63665904 bytes
51613 packets output, 6182592 bytes
1326373 cells input, 128804 cells output
0 OAM cells input, 0 OAM cells output
AAL5 CRC errors : 0
AAL5 SAR Timeouts : 0
AAL5 Oversized SDUs : 0
AAL5 length violations : 0

! Note the ATM PVC is Active

ADSL-Router#show atm pvc

Name	VPI	VCI	Encap Type	SC	Peak Kbps	Avg/Min Kbps	Burst Cells	Status
atm 1.1	8	35	SNAP	N/A	0	0	0	Active

! Note the ppp interface is UP meaning that PPP Negotiation including the
! authentication has succeeded.

! In case of trouble, start a "debug ppp authentication"

! Note the IP info learnt by the PPP interface:

! IP address, "Peer address" (router of ISP), DNS servers...

ADSL-Router#show int ppp 1

ppp 1 is **UP**

Configuration:

Keep-alive is set (10 sec.)
No multilink
MTU = 1500
Peer authenticates with **CHAP**
IP is configured
IP address **negotiated**

Link thru atm 1.1 is **UP**; LCP state is **OPENED**, negotiated MTU is 1492

Receive: bytes=60384371, pkts=76385, errors=0
Transmit: bytes=3555522, pkts=58391, errors=0
5 minute input rate 25720 bits/sec, 4 packets/sec
5 minute output rate 3064 bits/sec, 3 packets/sec

Bundle information

Queueing method: fifo
HDLC tx ring limit: 0
Output queue: 0/1/200/0 (size/highest/max total/drops)
IP is UP, IPCP state is **OPENED**
Negotiated Address=82.122.147.180 Mask=255.255.255.255
Peer address=193.253.160.3
DNS: Primary=80.10.246.130, Secondary=80.10.246.3
IP MTU=1492, Bandwidth=160 Kbps
LLDP State is STOPPED

! Lists the IP interfaces. They should be up.

! Note the IP address learnt on ppp 1

ADSL-Router#show ip int brief

Interface	IP Address	Status	Protocol
eth 0/1	192.168.1.1	UP	UP
ppp 1	82.122.147.180	UP	UP

! Lists the IP Route. Default route 0.0.0.0/0 results from PPP negotiation

ADSL-Router#show ip route

Codes: C - connected, S - static, R - RIP, O - OSPF, B - BGP

IA - OSPF inter area, N1 - OSPF NSSA external type 1

N2 - OSPF NSSA external type 2, E1 - OSPF external type 1

E2 - OSPF external type 2

Gateway of last resort is 0.0.0.0 to network 0.0.0.0

S 0.0.0.0/0 [1/0] via 0.0.0.0, ppp 1

C 82.122.147.180/32 is directly connected, ppp 1

C 192.168.1.0/24 is directly connected, eth 0/1

C 193.253.160.3/32 is directly connected, ppp 1

! After your start communications with the Internet, view the NATed sessions

ADSL-Router#show ip policy-sessions

Protocol (TTL)

Src IP Address	Src Port	Dest IP Address	Dst Port	NAT IP Address	NAT Port
----------------	----------	-----------------	----------	----------------	----------

Policy class "FROM-LAN":

tcp (600)

192.168.1.3	3646	66.28.8.50	80	s 82.122.147.180	3729
-------------	------	------------	----	------------------	------

tcp (600)

192.168.1.4	59227	192.168.1.1	22		
-------------	-------	-------------	----	--	--

udp (53)

192.168.1.4	54832	193.252.19.4	53	s 82.122.147.180	6088
-------------	-------	--------------	----	------------------	------

udp (53)

192.168.1.4	54833	193.252.19.4	53	s 82.122.147.180	6089
-------------	-------	--------------	----	------------------	------

udp (53)

192.168.1.4	54834	193.252.19.4	53	s 82.122.147.180	6090
-------------	-------	--------------	----	------------------	------