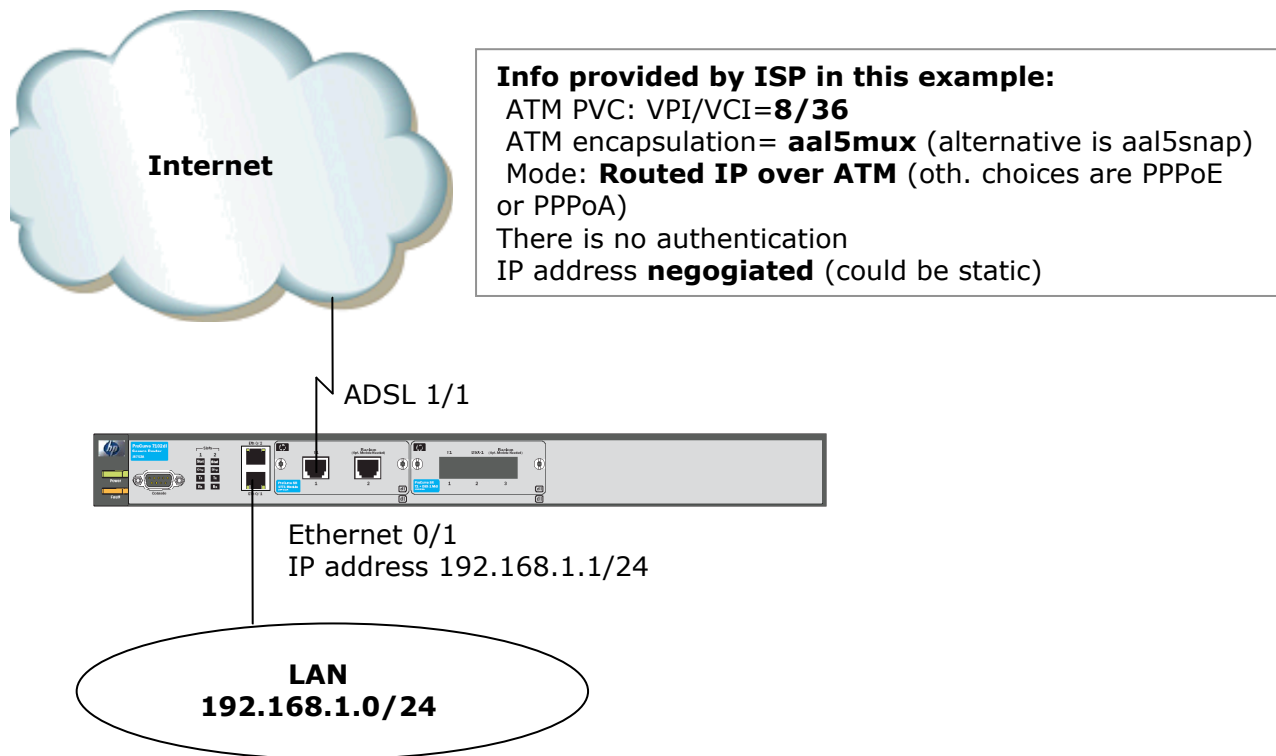


ADSL connection with Routed IP over ATM mode

Configuration example of the HP Procurve 7000 dl Secure Router



The Secure Router is directly connected to the ADSL interface without any ADSL modem.

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**.

RFC 1483 or **Routed IP over ATM mode** is used

- Layer 3 is IP and is defined in the ATM 1.1 subinterface

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 – IPoA configuration

```
hostname "Secure-Router"
```

```
ip routing
```

Enable Firewall

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

DNS, DHCP service and pool

```
! Define DHCP service for the LAN in the 192.168.1.0 range
! Router is defines as the Default-gateway and DNS-server
ip dhcp-server pool "pool-for-lan"
  network 192.168.1.0 255.255.255.0
  dns-server 193.252.19.4 193.252.19.3
  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 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
! Auto detects 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)
! Provider provides the info
bind 1 adsl 1/1 atm 1
```

ATM PVC (Permanent Virtual Circuit)

```
! This PVC is bound to a point to point ATM interface
interface atm 1.1 point-to-point
  no shutdown
```

```

! Provider defines what VPI/VCI (id of the PVC) to use.
pvc 8/36
! Following command defines Adaptation Layer and Routed IP over ATM option
encapsulation aal5mux ip
! IP address is typically obtained via DHCP.
! Note that your ISP may provide a permanent address via DHCP
ip address dhcp

```

ACL to define IP range from which the Secure Router can be managed

```

ip access-list standard manage-rtr
permit 192.168.1.0 0.0.0.255

```

ACL to define the traffic to be NATed

```

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

```

The Access Policy applied to the LAN Interface:

- first lets ip packets destined to internal IP stack to manage the router
- second "NATs" packets destined to the Internet using the IP of the WAN interface

```

ip policy-class FROM-LAN
allow list manage-rtr self
nat source list lan-acl interface atm 1.1 overload

```

(skip)

end

B) Check the connection

First check the status of your interface ADSL and ATM is UP

```
Secure-Router#show interface adsl 1/1
```

adsl 1/1 is **UP**, line protocol is **UP**

```

Link Status          Up G.DMT
Line Type            Interleave
Line Length          9480 ft

```

	Downstream	Upstream
Line Rate	6656 kbps	576 kbps
Current margin	9.0 dB	10.0 dB
Attenuation	38.0 dB	31.5 dB
Power	19 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	15	2
Line Inits	1	N/A
Rx Blocks	30881	30881
Tx Blocks	30881	30881

Corrected Blocks	11069	0
UncorrectedBlocks	27	5
Last Failure	NONE	
Last Failure Time	N/A	

```
DMT Bits Per Bin
000: 0 0 0 0 0 0 0 8 9 9 9 9 9 9 9 9
010: 9 8 8 8 8 8 8 8 7 7 7 6 6 6 0 0
020: 0 0 0 0 0 0 8 A B B C B C C C C
030: C B 9 C D D C D D B C C C C C B
040: 0 C C C C C C C B 9 8 A 7 9 9 B
050: B B B B B B B B A B B B A B B B
060: B B B B B 9 9 B B A 7 B B B A 9
070: A A B B A B A A 8 A A A A A 9 5
080: 9 9 A A A A 5 A A 9 8 7 2 7 9 9
090: 9 9 A 8 7 9 A 9 7 9 9 9 9 9 9
0A0: 9 8 4 7 9 9 9 9 8 9 9 9 8 9 9
0B0: 6 7 7 9 9 9 9 8 9 9 7 8 8 8 5 6
0C0: 8 8 8 8 9 8 8 9 9 8 8 5 8 8 8 8
0D0: 8 8 8 8 7 8 8 8 7 7 7 5 7 6 7 7
0E0: 7 7 7 7 5 7 7 6 6 6 7 6 6 6 6 6
0F0: 6 5 5 5 5 5 5 2 5 3 4 2 2 4 4 4
```

Secure-Router#show int atm 1

```
atm 1 is UP, line protocol is UP
  BW 576 Kbit/s
  16 maximum active VCCs, 16 VCCs per VP, 1 current VCCs
Queueing strategy: Per VC Queueing
  5 minute input rate 3328 bits/sec, 0 packets/sec
  5 minute output rate 800 bits/sec, 0 packets/sec
    484 packets input, 127924 bytes
    0 pkts discarded, 0 error pkts, 0 unknown protocol pkts
    3018 cells received, 0 OAM cells received
    751 packets output, 53038 bytes
    3 tx pkts discarded, 0 tx error pkts
    1606 cells sent, 0 OAM cells sent
```

Then check your WAN interface has an IP address.

Secure-Router#show int atm 1.1

```
atm 1.1 is Active
  Internet address is 82.67.71.47, mask is 255.255.255.0 (via DHCP)
  MTU is 1500 bytes
  Encapsulation is AAL5
  Encapsulation method is IP
  VC tx ring limit: 2
  Output Queue: 0/4/200/0 (size/highest/max total/drops)
  487 packets input, 145152 bytes
  754 packets output, 77232 bytes
  3024 cells input, 1609 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
```

Make sure all ip interfaces are UP.

Secure-Router#show ip int brief

Interface	IP Address	Status	Protocol
-----------	------------	--------	----------

atm 1.1	82.67.71.47	UP	UP
eth 0/1	192.168.1.1	UP	UP

Check your routing table. Note that a default route has been generated.

Secure-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 82.67.71.254 to network 0.0.0.0

```
S    0.0.0.0/0 [1/0] via 82.67.71.254, atm 1.1
C    82.67.71.0/24 is directly connected, atm 1.1
C    192.168.1.0/24 is directly connected, eth 0/1
```

Verify your Secure Router serves IP addresses to PC clients on LAN

Secure-Router#show ip dhcp-server binding

IP Address	Client Id	Lease Expiration	Client Name
192.168.1.2	01:00:0a:95:ab:bf:b0	Apr 07 2005 1:30 PM	JM

Verify that connections to the Internet from PC generate sessions on the stateful Firewall of your Secure Router

Secure-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)
  192.168.1.2      59869    192.168.1.1     23
udp (4)
  192.168.1.2      54940    212.27.39.2     53        s 82.67.71.47    1391
udp (4)
  192.168.1.2      54941    212.27.39.2     53        s 82.67.71.47    1392
Policy class "self":
Policy class "default":
tcp (6)
  82.67.93.31      1082     82.67.71.47     445
```

Secure-Router#sh ip policy-stats

Global 14 current sessions (83200 max)

Policy-class "FROM-LAN":

14 current sessions (27700 max)

Entry 1 - allow list manage-rtr self

13979 in bytes, 206692 out bytes, 17 hits

Entry 2 - nat source list lan-acl interface atm 1.1 overload

29263 in bytes, 110943 out bytes, **274 hits**