IPv6 with SFR

SFR has activated in august 2011 the IPv6 support on its ADSL boxes. Here are some snapshots of the configuration interface of a NeufBox 4 :



Figure 1. IPv6 activation on SFR box

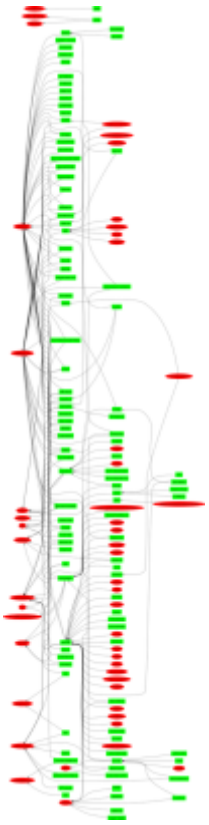


Figure 2. IPv6 parameters on SFR box

The IPv6 prefix that is used is:

- IPv6 Prefix: 2a02:8400::/25
- Owned by: LDCOM
- AS Number: 15557
- Allocated on: 2010-12-23
- First seen on: 2011-03-23 12:03:17

Figure 3 (click to get full size image) gives an overview of the Internet v6 ecosystem in France obtained with the autonomous system map tool.



Note the high IPv6 connectivity of Hurricane and Lambdanet as foreign providers and Neotelecoms as an internal provider.

A traceroute6 enables to verify the connectivity:

```
$ traceroute6 -n ipv6.google.com
traceroute6 to ipv6.l.google.com (2a00:1450:8007::6a) from
2a02:8420:209::XX, 64 hops max, 12 byte packets
1 2a02:8420:209::YY 1.254 ms 1.221 ms 0.821 ms
2 * * *
3 2a02:8400:0:3::11 32.980 ms 32.964 ms 32.117 ms
4 2a02:8400:0:3::142 35.891 ms 34.488 ms 80.187 ms
5 2001:4860::1:0:23 35.676 ms
2001:4860::1:0:9f2 34.713 ms
2001:4860::1:0:23 33.623 ms
6 2001:4860::8:0:3015 52.451 ms 43.599 ms
2001:4860::8:0:3016 44.782 ms
7 2001:4860::2:0:48c 44.284 ms 43.608 ms 46.274 ms
8 2001:4860:0:1::c7 55.404 ms 52.317 ms 54.170 ms
9 2a00:1450:8007::6a 45.815 ms 44.046 ms 45.221 ms
```

IPv6 Packet Capture

The SFR ADSL box, as a typical IPv6 router, send unsolicited Router Advertisement messages pseudo-periodically and solicited Router Advertisement messages in response to the receipt of a Router Solicitation message. The Router Advertisement message contains the information required by hosts to determine the link prefixes, the link MTU, whether or not to use address autoconfiguration, and the

duration for which addresses created through address autoconfiguration are valid and preferred. The packet capture given hereafter shows some interesting features of the IPv6 deployment by SFR:

1. The router lifetime is set to the default 30 minute value.
2. The prefix length is /64 (part of the /56 prefix announced on the web interface as seen in Figure 2).
3. The valid lifetime is equal to the preferred lifetime! A typical valid lifetime value is greater than the preferred lifetime in order to enable a soft renumbering of the hosts.
4. A recursive DNS server is given according to the recent RFC 6106 (obsoleting RFC 5006).
5. The Home Agent Flag is set and a Home Agent option is included int he RA! This indicates that the NeufBox is serving as a home agent on this link, according to RFC 6275 on mobility support in IPv6.

```
No. Time Source Destination Protocol Info
88 30.577228 fe80::217:33ff:fef2:XXXX ff02::1 ICMPv6 Router advertisement
from 00:17:33:f2:XX:XX

Frame 88: 150 bytes on wire (1200 bits), 150 bytes captured (1200 bits)
Ethernet II, Src: Sfr_f2:XX:XX (00:17:33:f2:XX:XX), Dst:
IPv6mcast_00:00:00:01 (33:33:00:00:00:01)
Internet Protocol Version 6, Src: fe80::217:33ff:fef2:XXXX
(fe80::217:33ff:fef2:XXXX), Dst: ff02::1 (ff02::1)
Internet Control Message Protocol v6
Type: 134 (Router advertisement)
Code: 0
Checksum: 0xe611 [correct]
Cur hop limit: 64
Flags: 0x20
Router lifetime: 1800
Reachable time: 0
Retrans timer: 0
ICMPv6 Option (Prefix information)
Type: Prefix information (3)
Length: 32
Prefix Length: 64
Flags: 0xe0
Valid lifetime: 604800
Preferred lifetime: 604800
Reserved
Prefix: 2a02:8420:209:7a00::
ICMPv6 Option (Recursive DNS Server)
Type: Recursive DNS Server (25)
Length: 24
Reserved
Lifetime: 600
Recursive DNS Servers: 2a02:8420:XXX:XXXX::1 (2a02:8420:XXX:XXXX::1)
ICMPv6 Option (Source link-layer address)
Type: Source link-layer address (1)
Length: 8
Link-layer address: 00:17:33:f2:XX:XX
ICMPv6 Option (Advertisement Interval)
```

```
Type: Advertisement Interval (7)
Length: 8
Advertisement Interval: 600000
ICMPv6 Option (Home Agent Information)
Type: Home Agent Information (8)
Length: 8
Home Agent Preference: 10
Home Agent Lifetime: 1800
```

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