(Some) Implementation Experiences with Homenet

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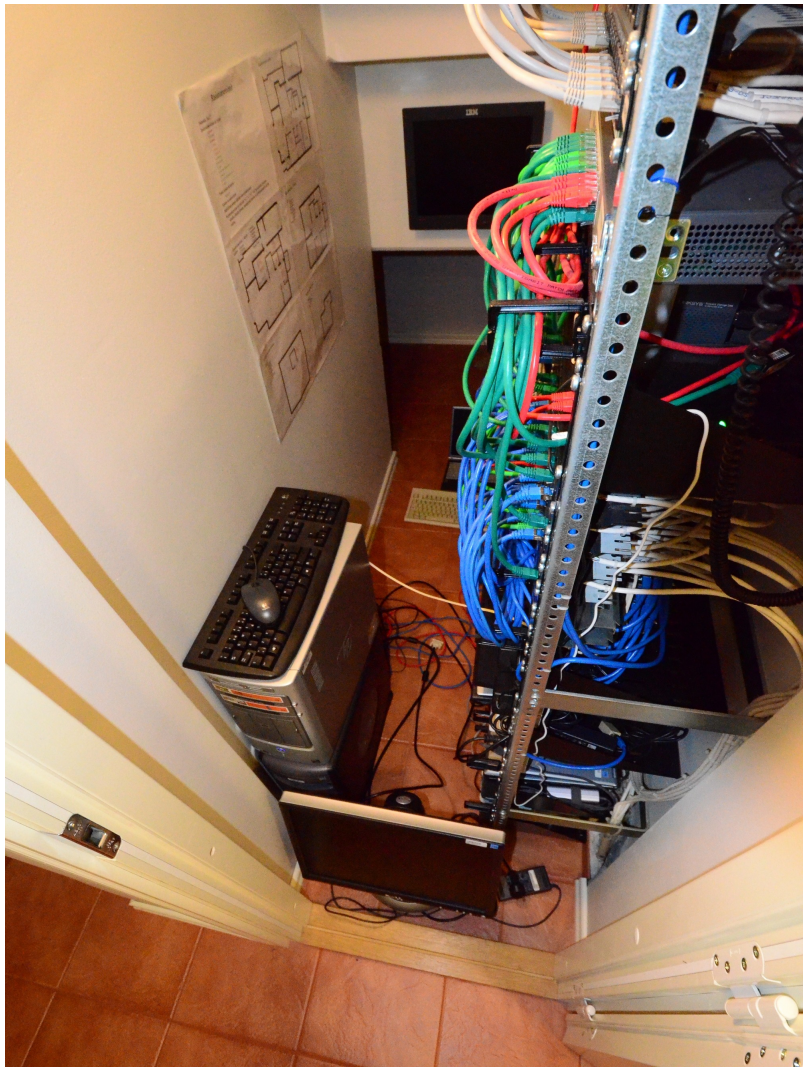
The World's First Homenet Network?



January

6:30am today

```
hord: debug: 21897, OSPF: Timeout causes a message resend
hord: debug: 21897, RAW: sendto destination fe80::20c:46ff:fe16:9c86
^C
root@newrouter:/tmp# cat /etc/hord/events
Selected own router ID: 16.191.119.86
Selected own hardware fingerprint: 16.191.119.86
Automatically assigned a prefix to an interface on interface eth1: 2001:db8:beef:ddd6::/64
Added a new neighbor on interface eth1: 49.66.233.220
Received a valid DD message from neighbor with sequence number on interface eth1: 49.66.233.220 195
Neighbor moves to EXSTART state on interface eth1: 49.66.233.220
DD sequence number to a neighbor initialized on interface eth1: 1008170920
Tentatively selecting ourselves as the master for the neighbor on interface eth1: 49.66.233.220
New DD message sent with sequence number, in response to a sequence number on interface eth1: 10081
This router becomes a slave to the following peer on interface eth1: 49.66.233.220
Negotiation done, moving to state EXCHANGE with neighbor on interface eth1: 49.66.233.220
```

```
Exchange done with neighbor on interface eth1: 49.66.233.220
Neighbor is now in loading state on interface eth1: 49.66.233.220
Sending a LSR with a number of LSA in it and remaining on interface eth1: 5 0
Received an LSU message from neighbor on interface eth1: 49.66.233.220
Added a received LSA of type on interface eth1: AUTOCONFIG LSA
Timeout causes a message resend on interface eth1
Received an LSU message from neighbor on interface eth1: 49.66.233.220
Automatically assigned a prefix to an interface on interface eth1: 2001:db8:beef:ebcb::/64
```

10:30am today

(But otherwise this is a very incomplete system... actual OSPF routing not running yet)

Goals

- See if OSPF-based homenet specifications can be implemented
- Build an implementation that will keep my home network autoconfigured
  - Much needed – I am lost as to what is where
- Make me understand routing better
- Write software that others could use
  - But the entire set of protocols proved to be difficult – extending existing software might be a better idea
- Building something that can be used in interoperability testing

Experiences

I have a very partial implementation so far, but here are some experiences:

- Draft-acee was very easy to implement
- Draft-arkko was easy to implement
- No major complaints wrt specifications
- But OSPF RFCs are... hard to read
- It is important to think about interfaces to other systems (NAT64, sensor gateways, ISP PD interface, or anything else that needs or gives address space)

Detailed Comments 1

- Variable length prefix formats are difficult to implement (so I didn't)
- Implementing an allocator from a matrix of usable and assigned prefixes is difficult in the general case

Detailed Comments 2

- We do not have enough specification about how the processes are started:
  - At what point do you decide that the rest of the network is not going to inform you about usable prefixes and, e.g., generate ULAs?
  - Immediate action might be harmful and, e.g., lead to flooding and withdrawing an extra prefix to the entire network
  - Remembering the action that we did on the last boot might be useful

Detailed Comments 3

- … more to follow

Protocol Values for Testing

#define hord_ospf_instance_id_default	0xAC
#define hord_ospf_lsa_type_router_autoconfiguration_lsa	0xAC0F