Experiences deploying DNCP in a home network

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Deployment scenario

- Dual-homed home network
- One home is actually a tunnel
- IPv4 and IPv6 from the ISP
- Edge router is an Ubuntu Linux server
- Several Wifi routers

Initial research

- There is a lot of documentation on how to do this, but it's all aimed at OpenWRT as the edge router
- Three HNCP implementations available
  - hnetd (requires cmake, couldn't get it to build on Ubuntu)
  - pysyma (no documentation)
  - shncpd (code readable, was able to build, some doc)
- I wound up trying to use hnetd on OpenWRT and shncpd on Ubuntu

Deployment

- Installed on Ubuntu
- Installed on OpenWRT
- Enabled on OpenWRT (documentation was difficult to follow, but I think I followed it)
- Enabled on Ubuntu
- Ten minutes later, network went down, had to go to serial consoles to get it back

What happened?

- The OpenWRT router through which I was connected lost its upstream IPv4 address because DHCP was no longer providing it.
- The IPv4 RFC1918 prefix I'd allocated was deconfigured on all interfaces for no obvious reason
- My host lost its IP address
- IPv6 didn't work
- Blrg.

Conclusions

- This is not ready for demo, much less prime time.
- Only a true believer is ever going to get this working
- If our goal is to produce a self-configuring network, we have a lot of work to do

Questions

- Where is the problem?
- Is it in the specification?
- Is it in one of the implementations?
- Is it in all of the implementations?

What I think

- There are some things that the specification requires that may be causing part of the problem I saw--the specification for how IPv4 addressing is handled seems overly pessimistic
- One of the reasons this broke is that we don't have a naming architecture yet, and so that wasn't on the box.
- We need to do some integration work, to the point where we have distributions that Just Work, and that do not assume that you are running the same distro everywhere on your homenet.

Specification update?

- One of the challenges I ran into is that the work of understanding the spec is substantial--it's not organized in a way that I found lent itself to bootstrapping an understanding of how HNCP was actually going to work on my network.
- This could be addressed with an HNCPbis spec, or with an ops spec for HNCP (oh the irony).
- The bottom line is, we have work to do here.