IPv6 Homenet with IS-IS

Feedback requested – Get involved now!

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Homenet – Overview

https://datatracker.ietf.org/doc/draft-baker-rtgwg-src-dst-routing-use-cases/

Homenet – Addressing

The Internet

ISP A

"TV-ISP"

ISP B

A:A:A:4::/64
B:B:B:4::/64
C:C:C:4::/64

A:A:A:2::/64
B:B:B:2::/64
C:C:C:2::/64

DHCPv6/PD
B:B:B::/48

DHCPv6/PD
C:C:C::/48

A:A:A:3::/64
B:B:B:3::/64
C:C:C:3::/64

A:A:A:1::/64
B:B:B:1::/64
C:C:C:1::/64

DHCPv6/PD
A:A:A::/48
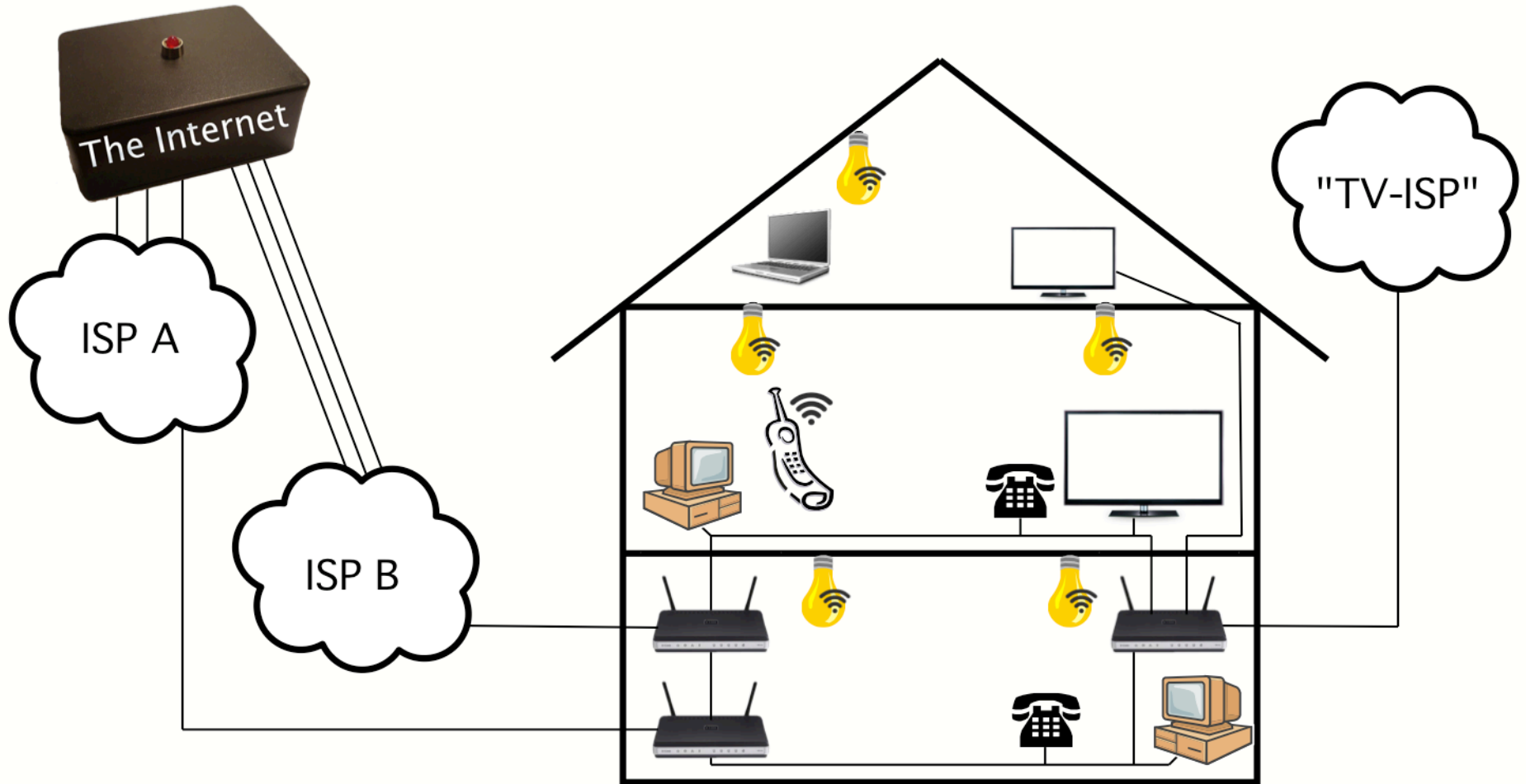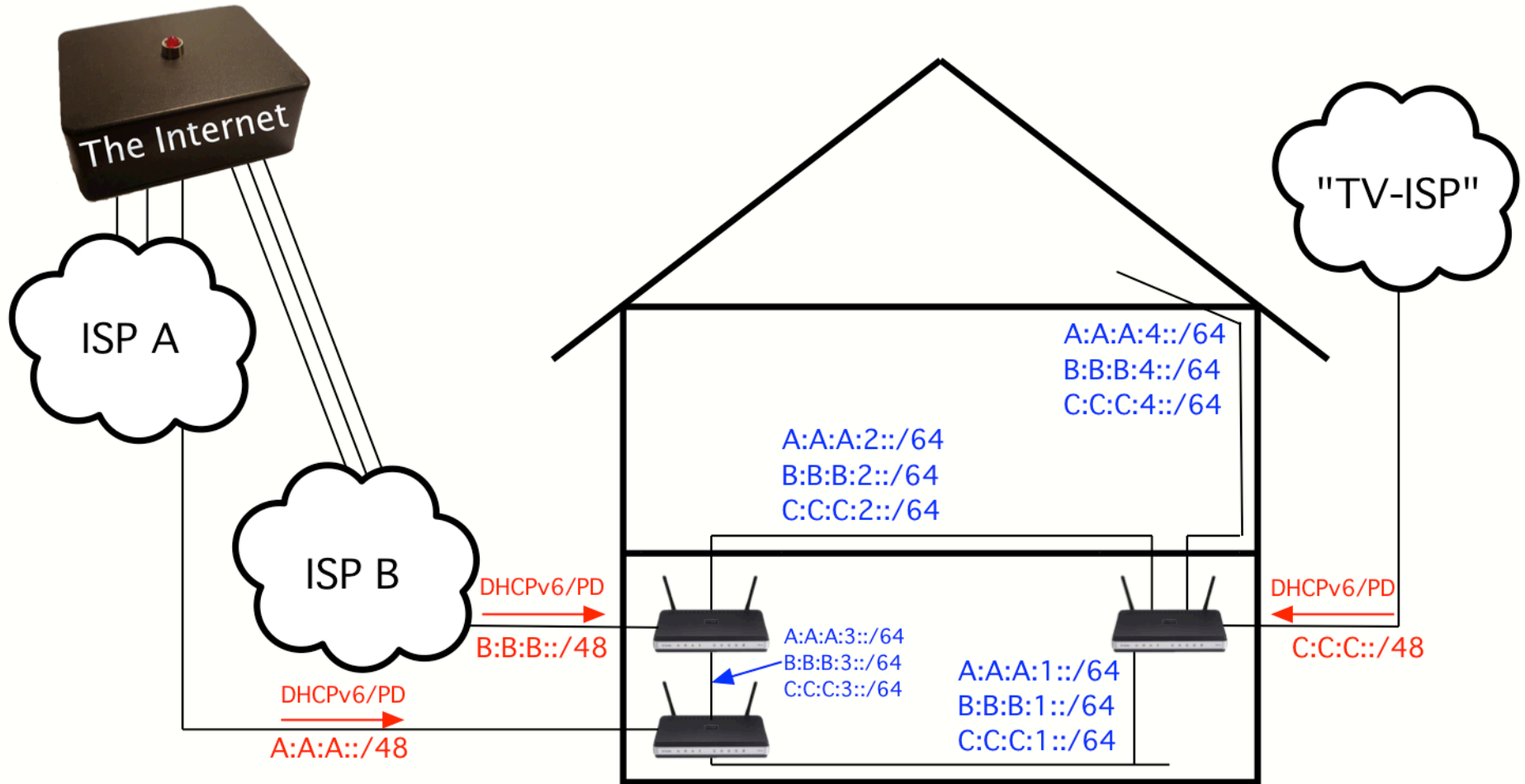
RFC 7368

IPv6 Home Networking Architecture Principles

https://datatracker.ietf.org/doc/rfc7368/

Overview of Homenet Principles and Ideas

‣ Global addresses for IPv6

‣ Src-Dest routing for IPv6

‣ Auto-Configuration

‣ Naming and Service Discovery

→ Please give Homeusers enough IPv6 space!

draft-ietf-homenet-hncp

Home Network Control Protocol

https://datatracker.ietf.org/doc/draft-ietf-homenet-hncp/

Defines HNCP protocol

‣ Link-State Protocol over UDP

‣ Runs on IPv6 link-local unicast and multicast addresses

‣ Assigns IP (v4 & v6) addresses on the homenet

draft-lamparter-rtgwg-dst-src-routing

Destination/Source Routing

https://datatracker.ietf.org/doc/draft-lamparter-rtgwg-dst-src-routing/
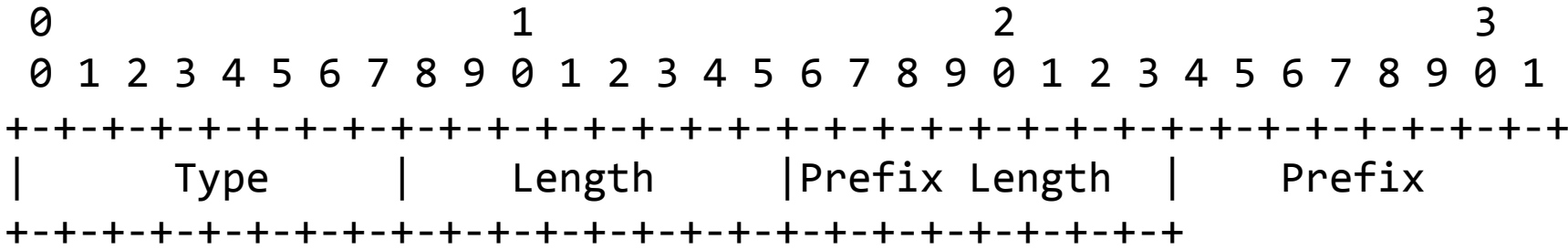
Defines SRC-DEST routing lookup

▸ For IPv6 only

▸ Routes without SRC-DEST are treated as a SRC of ::/0

▸ Defines how to lookup best route

  • DEST match first, SRC second

▸ Routes with SRC not ::/0 are ignored for Multicast

draft-baker-ipv6-isis-dst-src-routing

IPv6 Source/Destination Routing using ISIS

https://datatracker.ietf.org/doc/draft-baker-ipv6-isis-dst-src-routing/

Adds new Sub-TLV to IPv6 Reachability TLV for Source Prefix

```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|      Type     |     Length    |Prefix Length  |    Prefix
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

draft-lamparter-isis-reachability-critical-subtlvs

IS-IS Reachability with critical Sub-TLVs

https://datatracker.ietf.org/doc/draft-lamparter-isis-reachability-critical-subtlvs/

Defines a new Sub-TLV which is marked "critical"

‣ Used for the Source Sub-TLV in SRC-DEST routing

‣ If this Sub-TLV is unsupported, then the complete reachability TLV needs to be dropped

draft-liu-isis-auto-conf

ISIS Auto-Configuration

https://datatracker.ietf.org/doc/draft-liu-isis-auto-conf/

Defines Network, Authentication and Net-Duplication

▸ Area-Address: 13 octets of 0

▸ System ID: Based on a local MAC address

▸ NSEL: "00"

▸ Level-1

Net-Duplication

▸ New Router-Hardware-Fingerprint TLV sent

• Sent on first originated Level-1 LSP

• NOT based on MAC address

Want to try it out?

HNCP Protocol:

https://github.com/sbyx/hnetd/

ISIS Src-Dest Standalone:

https://git.netdef.org/projects/OSR/repos/isis

(requires Quagga Zebra with Src-Dest support – get it here)
https://git.netdef.org/projects/OSR/repos/srcdest

OpenWRT System:

https://git.netdef.org/projects/OSR/repos/openwrt-buildroot

Thank You

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Get Involved:
IETF Homenet WG
IETF ISIS WG
IETF Routing WG