

A photograph of a white ceramic sink with a chrome faucet. A yellow sponge with a black number '1' is on the left side of the sink. The sink is set into a white tiled wall. The floor is made of light-colored square tiles. A black object is visible in the bottom right corner.

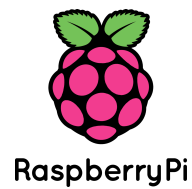
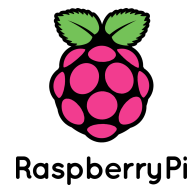
# IPv6 at Home

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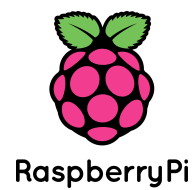
# How it started

- Being an IPv6 trainer since 2009
- Benjamins hobby is home automation
- Time to put our money where our mouth is
  - But how much money?
  - Can we do with v6 what we do with v4?

# How it was



**EPSON**



**heatmiser**  
Effective Temperature Control



**NETGEAR**



# Some specs

- UPC 20 Mbit/s\*
- Netgear WNR3500U/L wifi AP (standard firmware)\*
- Switch Sitecom 8 ports
- Media Center ASRock ION 330 running XBMCbuntu
- Netgear ReadyNAS RND4000 4 disks each 1.5T\*
- Webcam D-Link\*
- Printer Epson Stylus SX515W\*

# First challenges

- UPC Cable 20 Mbit/s gives only IPv4 over DHCP
  - But we need the speed
- XS4ALL ADSL 8 Mbit/s IPv4/IPv6 dual stack
  - only 8 Mbit/s because of distance to the DSLAM
- The default XS4ALL Fritz!box 7360 could not Multi-WAN
  - Lots of suggestions from Eric van Uden from AVM!
  - Supposedly works with Freetz ([freetz.org](http://freetz.org)) but seemed hassle ;)



# ..So then what?

The next idea was to use the ASRock ION 330 as a firewall/router with PFSense.

IPv6 support on PFSense is still in Beta and when we tried it, DHCPv6-PD was broken.

We contacted the developer, offered a testbed, but without result.

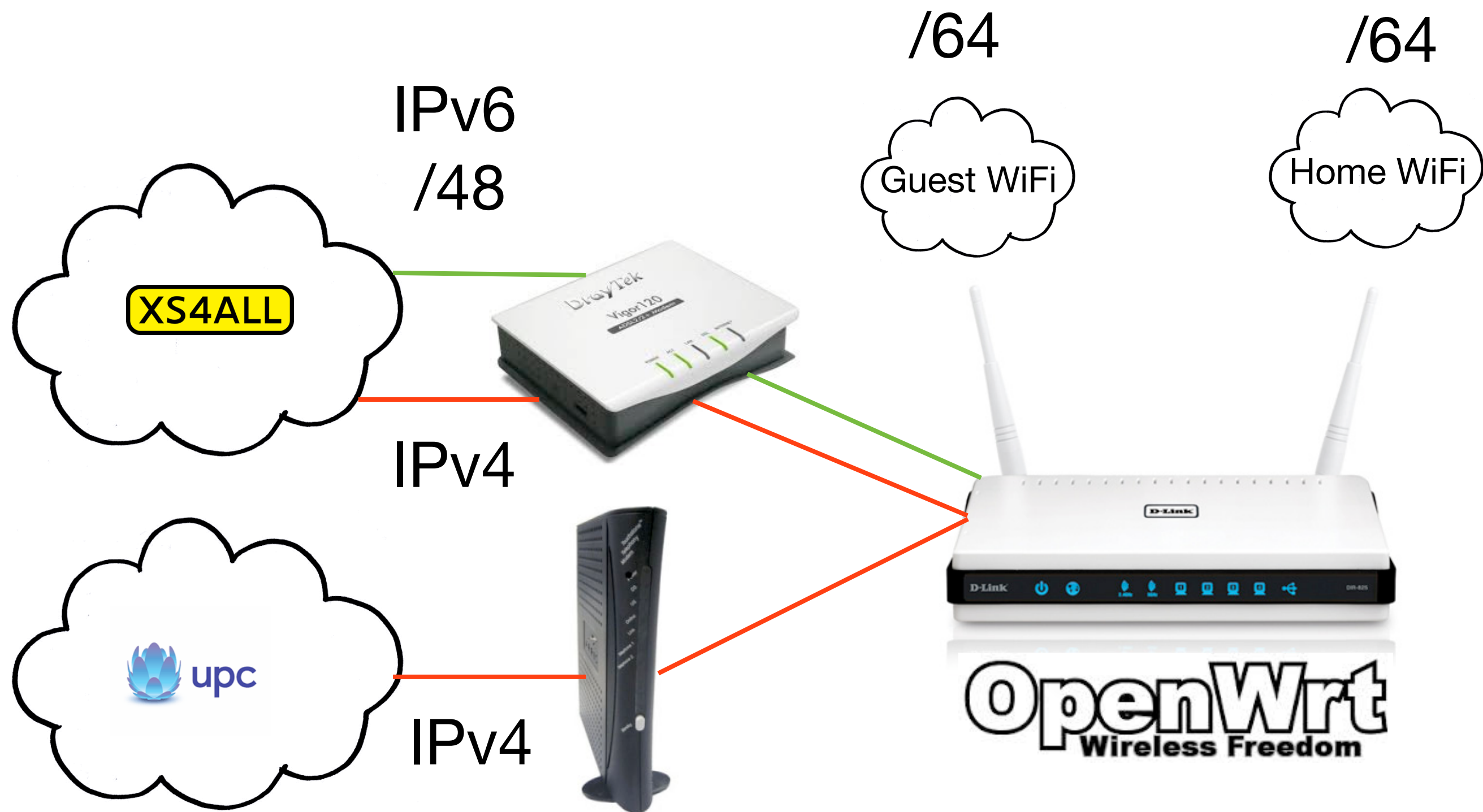


# First challenge solved

- OpenWrt Barrier Breaker on the D-Link DIR-825
  - Supports Multi-WAN
  - Bridge
  - Firewalls
  - DHCPv6-PD works
  - IPv4 traffic is load balanced
  - 86 Euro









# SLAAC vs DHCPv6

- We tried DHCPv6 but found our main devices didn't have (decent) support
  - Mac OSX 10.6.8
  - Android 4.2.2
- So we stucked to SLAAC (for now)

# Easy step: Media

- We have a Raspberry Pi in every room
  - serving as a media center
  - running Raspbmc
- Raspberry Pi and Raspbmc support IPv6
  - Raspbmc was not stable enough
  - Moved to OpenELEC

# The NAS

- Netgear ReadyNAS RND4000
  - No IPv6 support ever
  - Time for an upgrade anyway 😊
  - Homebuilt PC, ASRock Motherboard
- Ubuntu with ZFS
- Costs: 550 Euro Hardware and 200 Euro disks



# Mission Thermostat

- 2 Years ago, we bought a new thermostat
- Decided to buy Heatmiser PRT-WS WiFi
- 164 Euro
- Nice apps
- But no IPv6?!
- So, we contacted the support desk
  - No IPv6 support on the roadmap

# Tado works

- Difficult to find an IPv6 capable thermostat
- German company Tado has one
- Doesn't ship to NL yet
- Uses Thingsquare Mist (open source software for IoT)
- 99 Euro Per Year (wait....what?)

# I Spy: the Front Door

- D-Link IP webcam at front door (no IPv6)
  - sends pictures to e-mail
  - if door bel is pressed, a picture is taken and sent to private Twitter account with message: “the doorbel rang”



S[REDACTED]

20 Apr

14:34 - Ik hoor de deurbel!

@spacemnky @nathabeer [pic.twitter.com/lilUM1XWgi](https://pic.twitter.com/lilUM1XWgi)

[View photo](#)



# IPv6 at the door

- Logitech USB webcam (cheap, no IP)
- Raspberry Pi
  - running Raspbian
- Twitter and Twitter API don't do IPv6!
- Tweets are still sent over IPv4
- Looking at relay to unlock door over IPv6
  - Possibly with NFC key

# Webcam works over IPv6



(We don't have street visibility anymore!)

# IPv6 lights!

Our energy supplier offers  
IPv6 capable lights

So, we bought them:  
2 bulbs and a “gateway” for  
129 Euro

Plus an “e-manager” for 2,95  
Euro per month!





# Light specs

Theory:



Practice: We didn't get it to work over IPv6  
(sent an e-mail to GreenWaveReality)

# From a website

## The IPv6-Addressable Light Bulb Goes On Sale



GreenWave Reality and NXP launch 6LowPAN mesh-networked LED bulbs and home energy control platform.

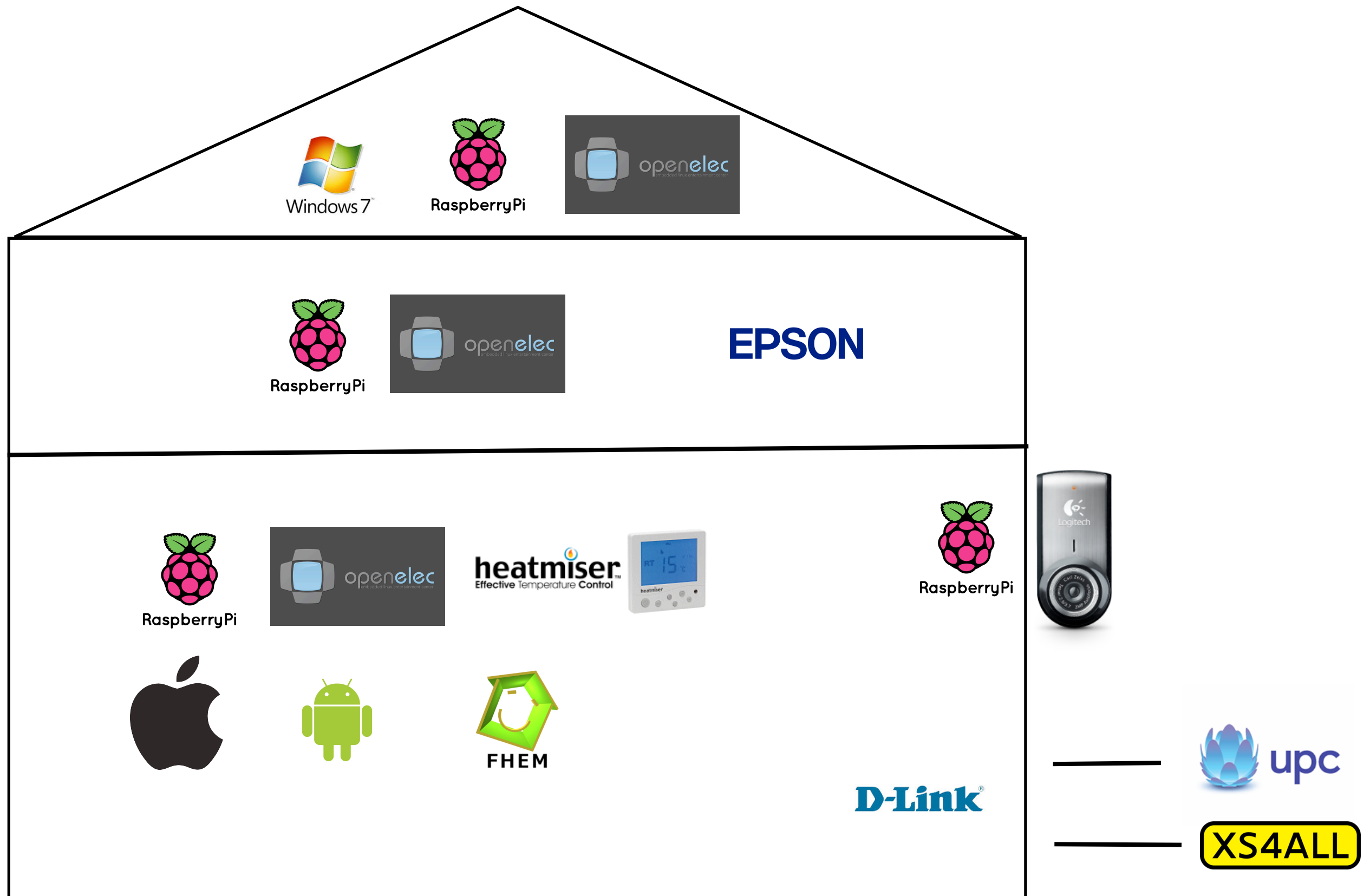
Jeff St. John  
October 22, 2012

What can you do with an LED light bulb that has its own internet address? And how much would you pay for it?

Why do these  
IoT devices  
only work in  
the cloud?!



# How it is



# To do

- Boblight over IPv6
- Buy a new printer
- Much more.....



# Lessons learned

- IPv6 in your house is not cheap
- There is a lot of manual labour involved
- Thank Goodness for Open Source!
- Vendors of commercial “home” products are not even aware of IPv6
- Not everything with IPv4 can be done with IPv6

# Thank you!



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