

IPv6 made simple

What it is, and how to deploy it to non-technical users.

presented by Graham Freeman

at LUGOD, Mon 19th Dec 2011

IPv6 at a glance

— [Unique identifier for a networked device.

— [Practically-infinite. No artificial scarcity.

— [Can co-exist with IPv4. (That's called "dual-stack".)

— [No need for NAT. Makes routing simpler, and firewall considerations more important.

— [Scary, and changes financial incentives. Adoption is slow.

IPv4 vs. IPv6

— [IPv4 (e.g. 66.109.99.12)

fewer IPv4 addresses than there are people

— [IPv6 (e.g. 2001:1868:a001:1::12)

more IPv6 addresses than there are atoms in our galaxy

— [IPv4: Well-understood, and deployed everywhere

— [IPv6: Work in progress since 1996.

Why: End-user's perspective

— [Q. What's an IP address, and why should I care?

— [A. It's an essential piece of the internet, which is an essential tool in your life. IPv6 empowers you by replacing an artificially scarce resource with a properly bountiful resource.

— [A. You don't really need to care. It should just work.

How: Netadmin (ideal)

— [ISP provides dual-stack native IPv4 and IPv6

— [NAT for IPv4, bridged IPv6 with a firewall in front

— [Basically nobody in North America does this (yet).

How: Netadmin (Sonic.net)

— [IPv4, with end-users on NAT

— [IPv6 via 6to4 pass-through

— [Sonic.net does this

How: Netadmin (any ISP)

— [IPv4 as normal (likely with NATted end-users)

— [IPv6 via tunnel

— [Routers/firewalls: Vyatta, m0n0wall, pfSense

— [Tunnel providers: Colo at dual-stack provider, or tunnel via Tunnelbroker.net

— [Local ISP need not know IPv6 exists

How: End-user

— [Turn on computer.

— [Use computer.

— [Most traffic will continue to go via IPv4, but some will go via IPv6. The end-user will never see the difference.

— [(Yes, IPv6 is newer and in theory less reliable. In practice, your local network is the weak point.)

How: Power-user

— [The computer can turn off?

— [The “firefox-showip” extension shows the IP address of each web page in Firefox.

— [www.xkcd.com is IPv6-enabled, as is www.local123cafe.com, as is www.google.com (sometimes).

— [Everything still just works.

How: Power-user on the go

- [VPN to dual-stack-enabled network

- Build & run your own

- Use Sonic.net's VPN, which supports 6to4

Resources

— [Vyatta: robust Linux-based firewall/router solutions
www.vyatta.org (free) or www.vyatta.com (well-supported)

— [m0n0wall: simple FreeBSD-based firewall/router software
www.m0n0.ch

— [pfSense: fancy FreeBSD-based firewall/router software
www.pfsense.org (IPv6 support is still beta)

— [www.tunnelbroker.net: Free IPv6 tunnels from HE.net

fin!

— [**Graham Freeman**

— [**+1 510 495 1655**

— [**graham.freeman@cernio.com**

