IPv6 made simple
What it is, and how to deploy it to non-technical users.
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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!

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