

Is IPv6 Inevitable?

And if it is, what should we do about it?

Future Net Expo 2008

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Context

- Renesys provides analysis services for the Internet (the real Internet—IPv4)
- Our customers are large Internet service providers and the US Government
- We know a **lot** about the way the Internet is put together
- We are IPv6 agnostic—it's just another networking protocol that we would analyze if it were used

Terms

- IPv4 – the Internet
- IPv6 – a new, Internet-inspired protocol that is incompatible with the current Internet
- Regional Internet Registries – allocators of addresses
- Prefixes – blocks of IP addresses
- NAT-PT – Network Address Translation with Protocol Translation; the only way to get to the Internet from IPv6

Inevitable?

- Mandated by US Government for most agencies some time soon (support and planning are extremely uneven)
- Supported (in some form) by most equipment manufacturers
- IPv4 addresses will run out (2010 or 2011 or 2022 depending on lots of factors)
- **No compelling alternative**, other than:
 - Market for IPv4 allocations
 - Lots and lots of NAT

What's wrong with IPv6

No transition plan from IPv4 to IPv6

[Lots of other quibbles but that's the only point that actually matters.]

IPv6 Isn't Catching On (yet)

- Defensive moves:
 - Lots of prefix allocations in 2005-6
 - Lots of hardware with **basic** IPv6 support by 2005-6
 - Transit providers start offering free IPv6 service (mostly tunnelled) alongside IPv4
 - IPv6 becomes a standard RFP requirement
- Little active use
 - No IPv6-reachable content
 - No production quality IPv6 NAT-PT
- Things are dire, but no one is doing much?

Missing: End-user Financial Motivation

- The business case for IPv6 is almost impossible to make
- Weak: If IPv6 catches on, have support in hardware, software, tools
- Stronger: If we adopt IPv6 before our competitors and bad stuff happens, we'll have an advantage.
- Neither is sufficient.

•What's missing

- Working NAT-PT
 - Without Network Address Translation with Protocol Translation IPv6 users can't access the Internet
 - No one will use a network protocol that isn't on the Internet ever again
- An IPv4 Trading Market
 - Without a trading market, IPv4 will be free and then unavailable
 - IPv6 will never be a smart alternative

Government Intervention: Likely

There are at least two outcomes of this story that end in unwanted Government Intervention:

- The end of IPv4 allocations is so badly managed that actual operational problems occur for real customers
- A market in IPv4 arises and requires regulation (as do most commodities markets).

Third paths welcome.

The Answers

- IPv6 Inevitable: Sadly, probably so.
- What should we do about it?
 - Stock up on needed IPv4 addresses soon
 - Get experience with IPv6. Lot of good engineering information out there (www.nanog.org for a start).
 - Get working NAT-PT
 - Hope that I'm wrong.

Thank You

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