

IIJ

Internet Initiative Japan

# NANOG & APRICOT Networks: IPv4 & IPv6

**IEPiggy - Philadelphia**

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Randy Bush <randy@psg.com>

<http://rip.psg.com/~randy/080309.iepg.pdf>

# Can We Use IPv6?

- We should use Ipv6 ourselves before pushing it on customers
- Is it practically usable?
- How to make it practically usable?
- At NANOG and APRICOT we sampled two ways of making it usable

# The Model was Enterprise

- Consumers depend on ISP, and many models there
- Enterprises likely to be the ones who can not get IPv4 first
- Enterprises are more controlled environments
- They're my customers :)

So What is it Like to be  
an Enterprise which can  
Only Get IPv6 Space?

# Pure IPv6 Network

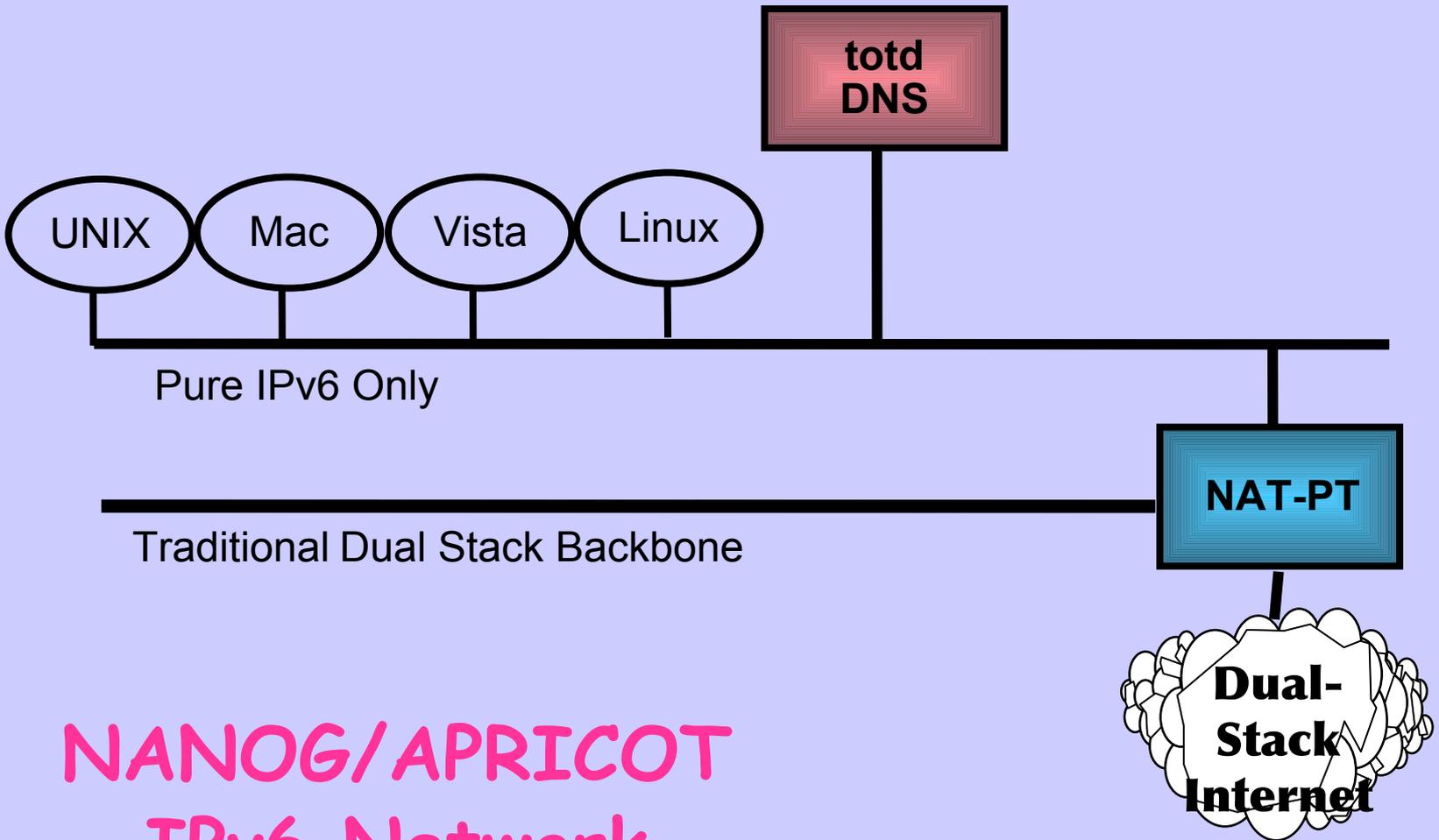
- Would not get to 99.9% of the net
- So here is the dancing kame turtle



- It's a terribly cute meme, but perhaps you wanted more?
- Maybe an ISP's customers want more?

# Pragmatic IPv6 LAN

- An IPv6-only network with NAT-PT at the border & totd
- Now we can get to the IPv6 world and the IPv4 Internet
- See the kame and see Yahoo!
- This should work for UNIX, Linux, Mac, Vista, ...



# NANOG/APRICOT IPv6 Network

# NAT-PT

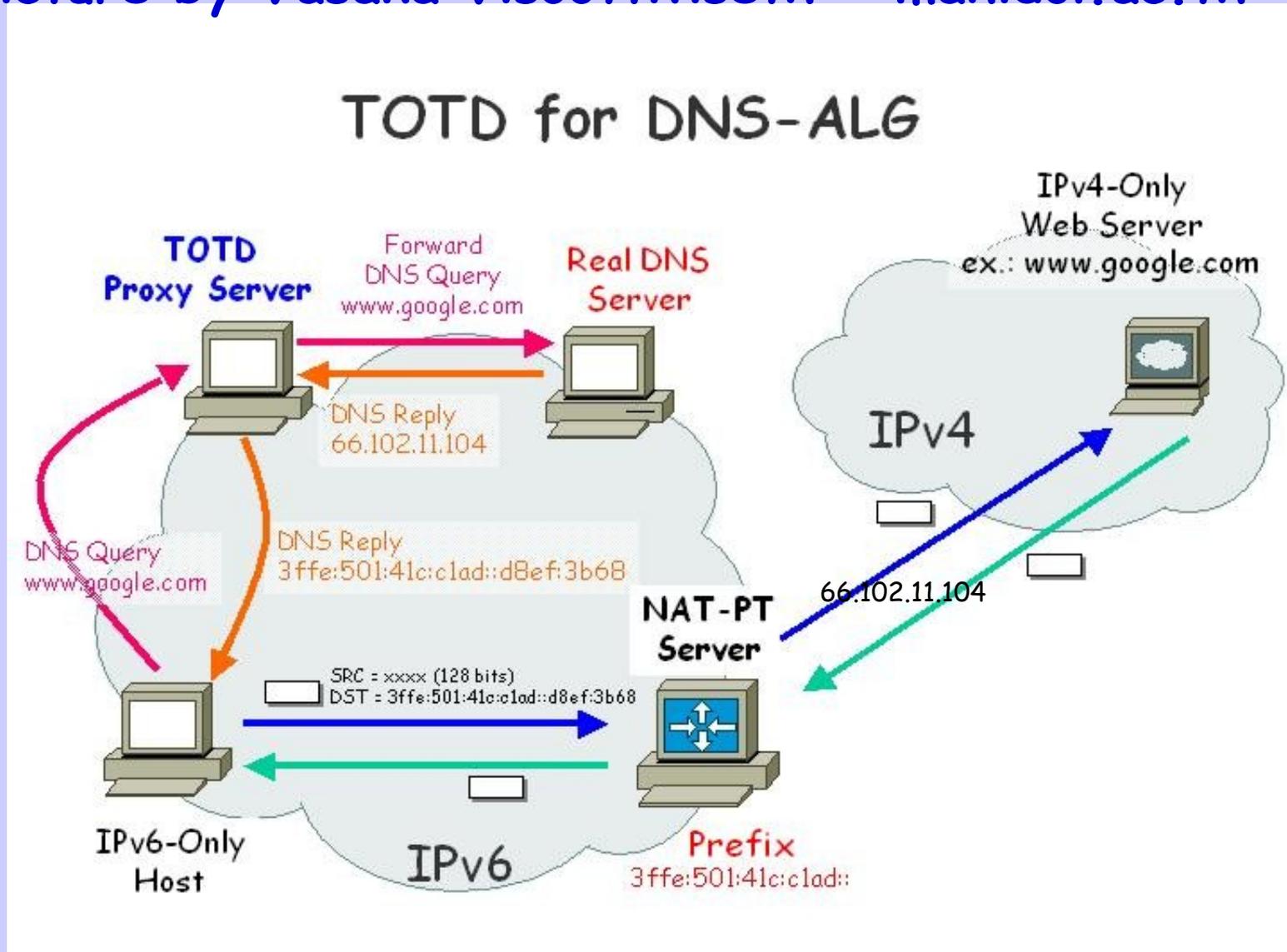
- IPv6-only on inside, dual-stack IPv4 and IPv6 on the other
- Stateful translation of TCP when no IP Addresses are embedded
- ALGs needed for FTP, RTP, ... where addresses are embedded

# The DNS Hack

- On a pure IPv6 network, if I get an A record, what do I do?
- Panic, you can not use an A record
- So the local DNS Cache has a hack, *totd*, which takes an A, embeds it within a hacked IPv6 prefix, and synthesizes an AAAA
- NAT-PT knows the hack prefix, and strips it back to IPv4 to dual-stack

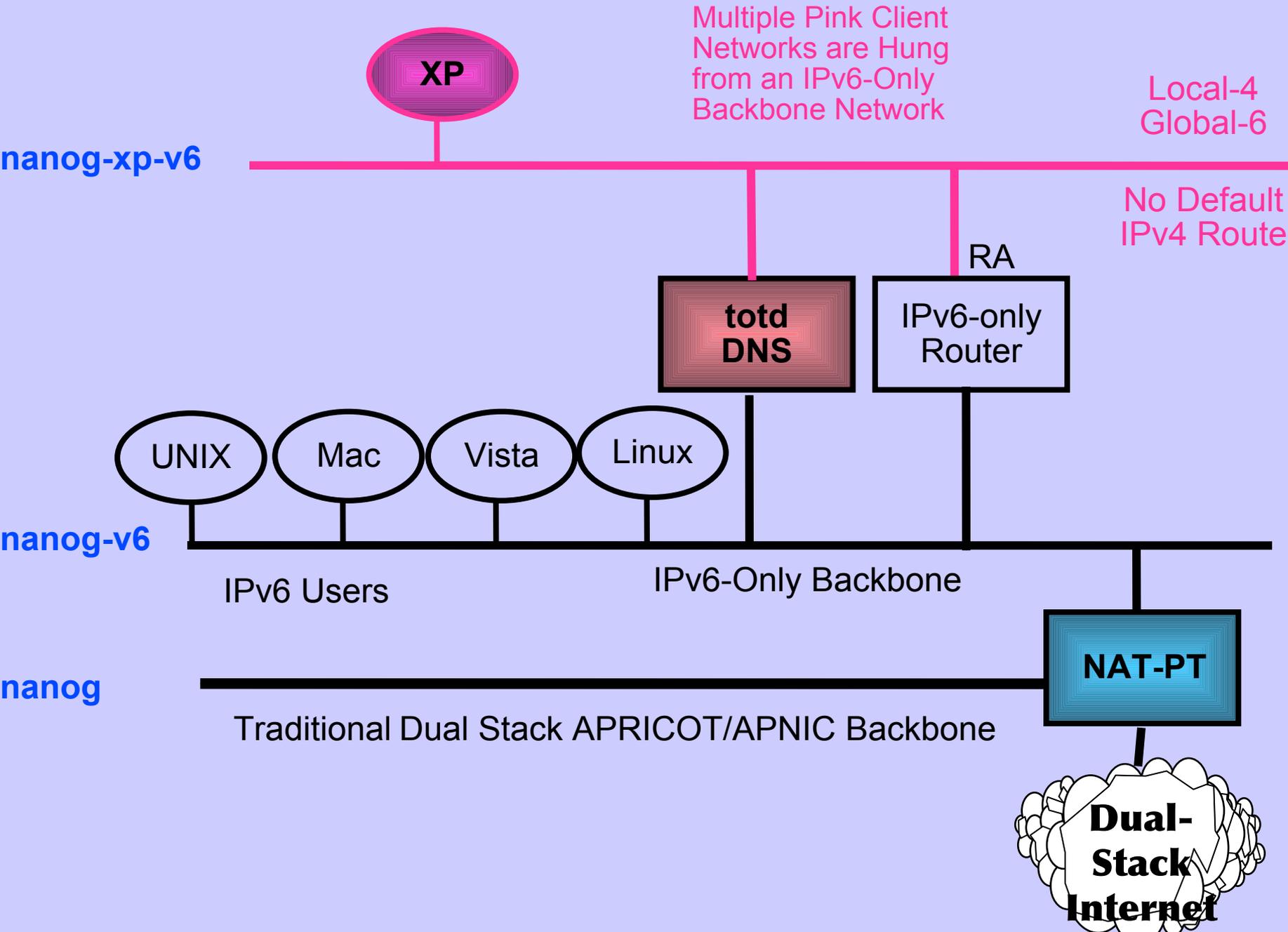
# totd - DNS Trans Proxy

Picture by Vasaka Visoottiviseth - mahidol.ac.th



# Windows XP

- XP can move payload over IPv6
- But does **not** do DNS over IPv6 transport (bad bug! "Buy Vista")
- So, the LAN has 1918 IPv4 space to carry DNS, but no exit for IPv4
- You get an IPv6 and IPv4 Address but should use the IPv6 for all real transport as IPv4 has no default



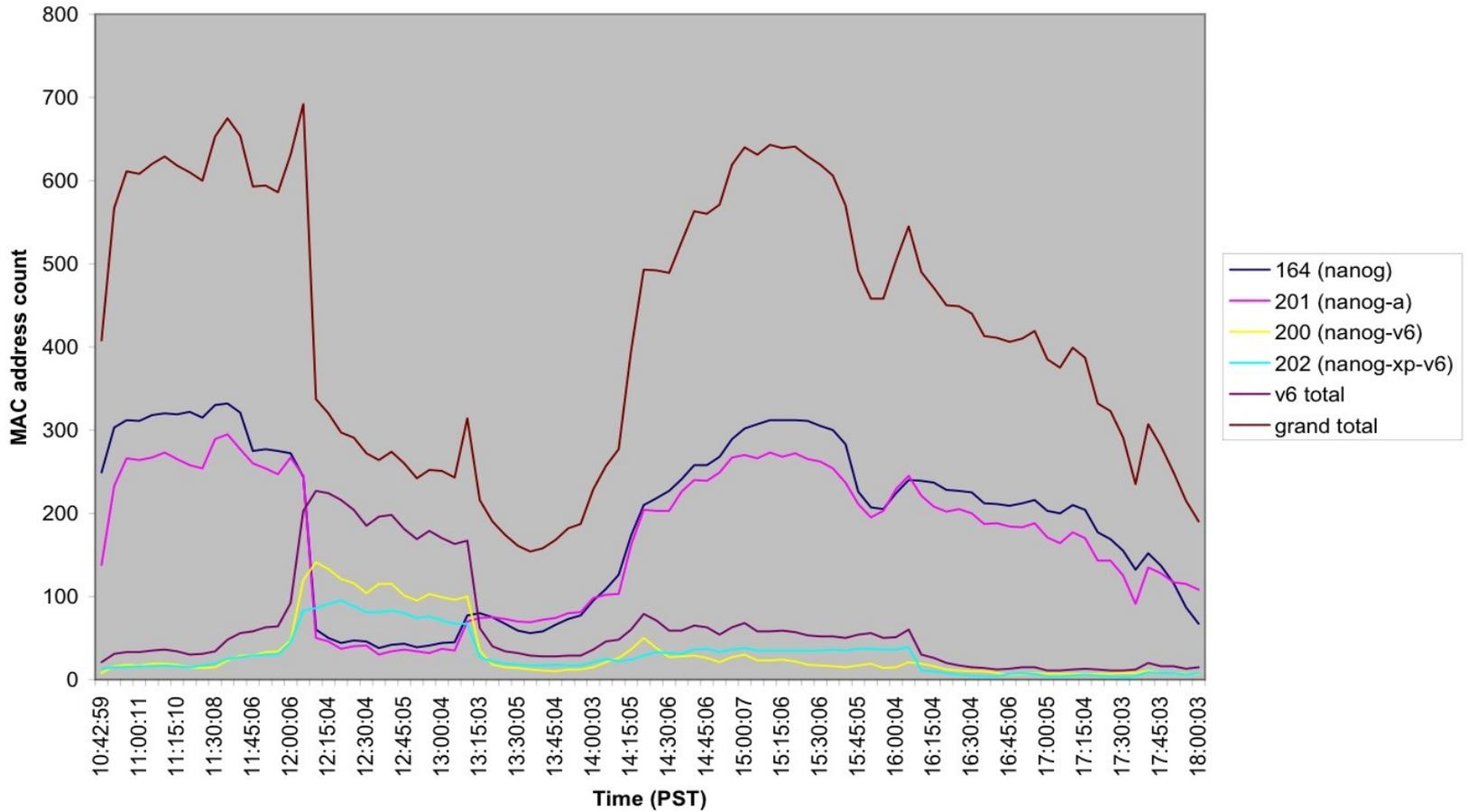
# Access

- All SSIDs up from start
  - apricot normal fully dual-stack
  - apricot-v6 with NAT-PT
  - apricot-xp-v6 with 1918 DNS trans
- Wednesday, for 90 minutes, apricot went away
- At NANOG we gathered stats
- Not really at APRICOT

# What We Learned

- $\frac{3}{4}$  of users said they could get on net but it was actually more like half
- Every component except UNIXes had bugs: NAT-PT, Vista, MacOS, ...
- The prize to MacOS which dropped capital A from DNS server entry
- We hope vendors now working to fix

MAC address counts by VLAN at NANOG42; Data from Tuesday, Feb. 19 2008  
(times corrected to PST)



# How You Can Play

- <http://www.civil-tongue.net/clusterf/>
- Has instructions for platforms
- Has instructions how to turn it back off for when you go home!
- Is a wiki, so ... If you want to play:
  - Create a login ID, open a ticket and request editor privs
  - You can also use tickets to report problems, send feedback, etc.

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