

IPv6 ... making progress

2012 Fall Conferences

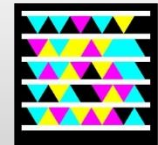


Tony Hain

CEO

Hain Global Consulting, Inc.

tony@hain-global-consulting.com





Agenda

- Where are you?
- Management buy-in
- Processes
- Tools
- Human factors
- Milestones
- Measuring progress
- Wrap up



Mental & Emotional preparation

IPv4 to IPv6 transition and the stages of grief



For many, ***IPv4 knowledge is their justification of value in the market.*** As demand for that knowledge withers, and demand for the unfamiliar grows, people progress through the stages of grief in a futile attempt to avoid the inevitable.



What does your organization value?



*Independent Thinking
& Strategic Avoidance*



Safety of the pack

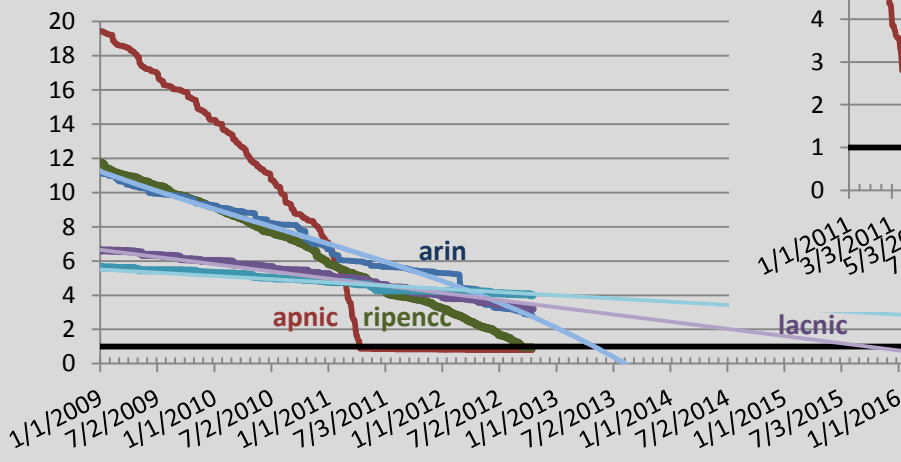
Heroic Rescue



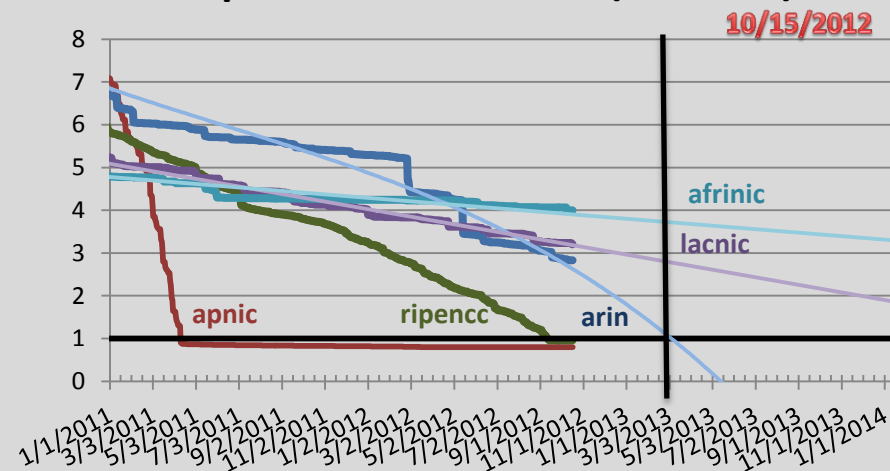
Projecting RIR IPv4 pool depletion

- IANA exhausted the central pool Feb. 3, 2011
- APnic activated their 'final /8 policy' April 15, 2011
- RIPE activated their 'final /8 policy' Sept. 14, 2012
- ARIN slowed for awhile but has been picking up lately.

RIR pool exhaust dates



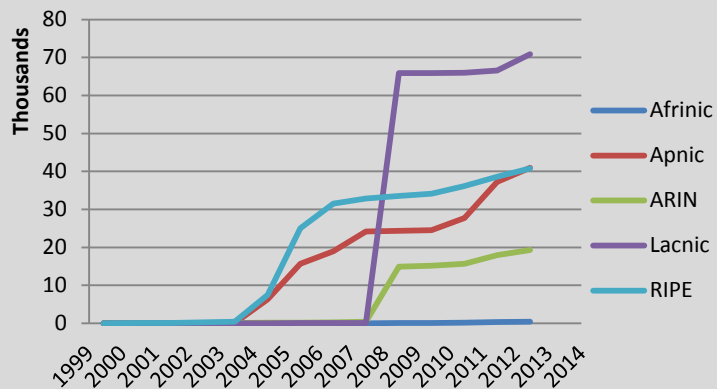
RIR pool exhaust dates (zoomed)



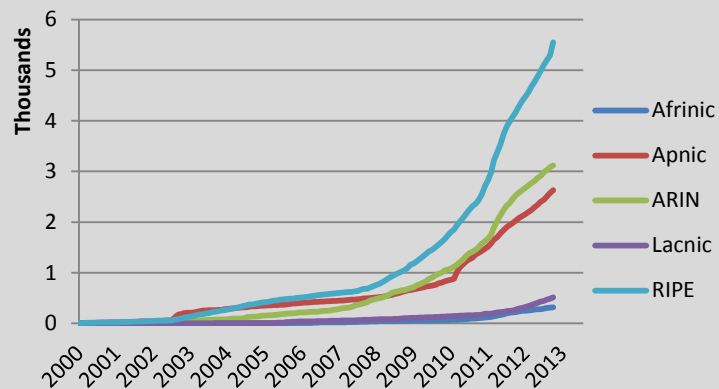
Collective RIR IPv6 Allocations



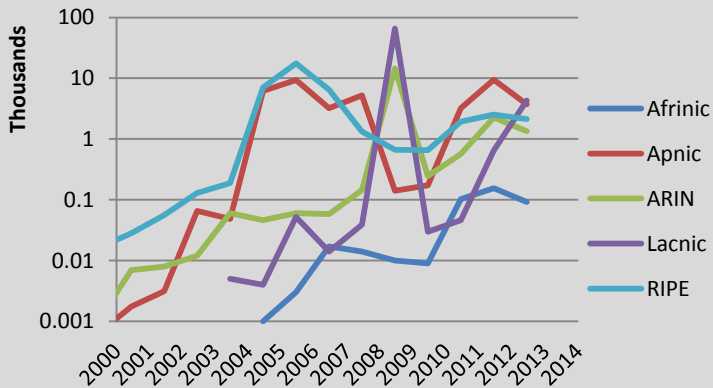
RIR -- IPv6 /32 equivalent allocations



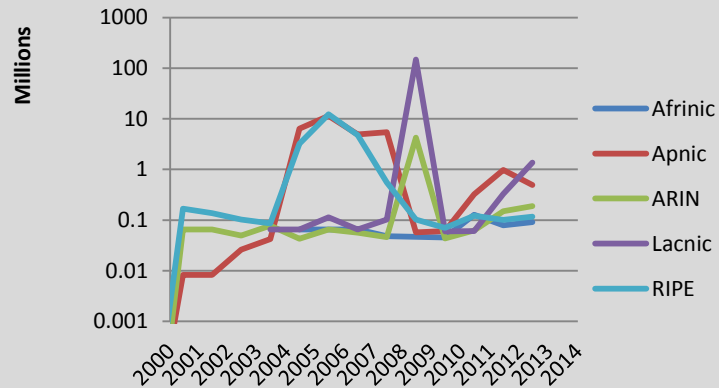
RIR - IPv6 allocation events



RIR -- IPv6 /32 equiv. per year



RIR -- IPv6 avg. /48 equiv. per allocation event





Management buy-in

- Driving from the top or bottom?
- Making the case about business continuity requires recognizing the global shift in client platform to mobile devices.
- Engineering needs to be aware that the IPv4 routing table will explode as fragments of legacy allocations are sold off and routed as independent blocks.



Avoiding failure

- Get started !

The only way to fail is ... do nothing.

Study and preparation are necessary to a point, but delay from excessive planning has the same impact as delay due to remaining in denial that action is required.



Processes

- Assessment of the current network.
 - Technical capability of equipment
 - Design and operational assumptions ::: ask why
- Assessment of the evolved network
 - Shifts in client platform & UI
 - Enable first, optimize later
- Find the business driver
 - IPv6 deployment is about business continuity
 - Drive vendors & service providers to align with your business schedule
- Use transition mechanisms to minimize costs
 - Tunnel over older gear until it reaches end-of-life
- Configure some systems as IPv6-only
 - Identifying IPv4 dependencies may not be trivial



Tools

- Network management software
 - Traffic analysis : don't miscount tunneled traffic
- Firewall placement and rules
 - Protecting hosts vs. protecting data in a central store
- Spam mitigation tools
 - Open source tools often have incomplete IPv6 support
- NTP peer set
 - Caution:: asymmetric tunnel paths will cause ntp offset
 - OWPING <http://www.internet2.edu/performance/owamp/index.html>
- Pentest
 - <http://nmap.org> (rather pathetic & manual IPv6 function)
 - <http://www.thc.org/thc-ipv6/>
- WWW
 - Google Analytics <http://labs.apnic.net/tracker.shtml>
- DNS
 - RIPEstat <https://labs.ripe.net/Members/becha/ripestat-dns-widget-for-world-ipv6-launch>



Human factors

- Memorizing and typing addresses will fail
 - DNS is more critical than in IPv4
 - Use of [] around address required sometimes but not others
- Hex factoring is difficult for many
 - Stick to nibble boundaries when possible
- Consistent subnet size
 - /64 is not required, but simplicity should be the rule
- Screen real-estate is consumed faster
 - Multiple addresses in addition to longer
- Multiple addresses per interface is different
 - This will just take time to get used to



Milestones

- Lab
 - Start simple, gain experience
- Engineering & support desktops
 - Daily use for familiarity
- Business case 1st step
 - Frequently externally facing web
 - Self-contained application like network management
- Plan to move one business application at a time
 - Enable support systems; then servers; then DNS
 - Expect a 3 - 5 year deployment timeframe



Measuring progress

- Focus on business drivers
 - Traffic will shift naturally as the path allows
 - Use DNS resolution as a control point
- A successful IPv6 deployment should be transparent to the end users, so there should not be direct feedback. This means measurements need to be in the background.
- Track: training; equipment, software, & tools upgrades; business applications that have been enabled; and **unfulfilled IPv6 queries against services that are not yet enabled.**



Bottom line ...

There is no *'one size fits all'* deployment model for the IPv4 Internet --- Sooooo ...

There is no 'one size fits all' transition deployment technology or approach.

Like it or not, multiple approaches will exist in parallel until IPv4 is finally weaned out of the system. This will happen in the core faster than at the edge, just as it has with every other preceding network technology.



Wrap up

- Make progress and avoid failure by taking action
- Staff attitude and training will impact progress
- Understand the current and target networks
- Update tools and focus on simplicity
- Plan for a 3-5 year deployment timeframe
- IPv6 deployment is about business continuity ...

Get started now!



Questions?

info@hain-global-consulting.com

<http://hain-global-consulting.com>

