IPv4 Exhaustion – What Now For Hosting?

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Why Do I Care About Hosting

For Those of you from 1998...

• Hosting is no longer small potatoes web hosting
• $30b annual business with managed hosting, dedicated, cloud, et al

• What’s hosted?
  • Primarily SMB and enterprise applications – email, database, HR, Accounting – production systems

There will be a quiz, later!
Different set of problems from carriers

Endpoints are servers

- What if you had 1/1000\textsuperscript{th} the number of customers and they paid you 1000 times as much?
  - Average managed hosting revenue per customer is $60k/year!
- Tolerance for disruption is lower due to server-centric nature of end-points
- Lack of enterprise understanding or urgency re: V6
  - “It’s your problem”
  - “boy who cried wolf”
The Easy and the Hard

“The customer experience is not about the packet being shipped to them! It's about end-to-end experience – typing in URL to application delivery.”

- VP of Engineering, Major Hosting Provider
The Easy and the Hard

Servers and network are the “easy”

• Most new servers are being deployed dual-stack
• Networks have IPv6 enabled
• DNS has IPv6 turned on with IPv6 records for newer servers
The Easy and the Hard

Everything else is hard

• OSS and Billing systems are primarily IPv4
• “Support Equipment” is a massive concern – firewalls, IDPS, Load Balancing
• Need for real IPv4 <-> IPv6 NAT solution is real
  • Hosting providers not feeling the love
  • “There is no carrier grade NAT” – VP of Networks, Major Hosting Provider
  • “We need hosting grade NAT” – VP of Engineering, Major Hosting Provider
Looking for the magic box!

• Not necessarily a monolith device
  • One per customer is fine for some applications
  • Enables separate compliance and billing requirements
• Does not need to sit at the network edge – can exist at the server edge

The Easy and the Hard
Top Concerns

• Carriers not particularly useful
  • “I wouldn't assume my upstreams would be taking care of anything. And if anyone believes that (or that anyone else is taking care of it) - they are doomed.” – VP of Network Operations, Major Hosting Provider

  • Patchwork of IPv6 compliance at upstreams is a concern – suboptimal IPv6 traffic routing to end users

• Scaling concerns with IPv6 – software and hardware
  • Lots of new code rolling out rapidly to patch problems in first 6 to 12 months of IPv6 deployment leading to network instability
  • “stacking up multiple points of failure”
Top Concerns

• Troubleshooting
  • Most significant concern
  • DNS mentioned repeatedly
  • How will technical staff distinguish and diagnose IPv4/IPv6 issues?
  • Return of packet sniffing to a standard part of the network engineer toolbox?

• The Day After
  • Addressing servers with IPv6 only?
  • Many hosted servers already have RFC1918 addresses for v4
  • Customers will hold hosting providers responsible, not access networks

• Legacy servers
  • IPv4 only
  • Transition strategy is refresh – but there are hundreds of thousands of them
Conclusion

• Reasonable preparation
  • False starts from “Internet Community” including RIRs and IETF were not helpful
  • Hosting sector growing rapidly – complicated factors
• Not yet ready
  • Hardware vendors and scaling concerns top issues
• Prepare for a prolonged period of instability
  • Reachability issues
  • Tough to troubleshoot problems
  • Lower customers satisfaction
Questions?