OTDR – IPv6/DNS Symbiosis

Changes to the System

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Lemas

• IPv6 is fundamentally a different protocol that IPv4
• Larger addresses
  – harder to remember / not mnemonic
  – packet size changes
• DNS presumes IPv4
  – UDP packet size
  – hard to add new features
Questions

• Sound Software Engineering practice discourages “rebuilding the airplane in flight”
• Is the code stable?
• Is the spec stable?
• Will there be infrastructure “issues”?
• 1998, several root ops folk built a closed testbed to test the impact of IPv6
  – New RR types
  – Native IPv6 transport
• 2000, announced the testbed to operators and began to open it for selected testing
• Some information at http://www.rs.net
First pass lessons

- IPv6 RRs can be added to nearly all deployed DNS nodes (not DJBDNS, ULTRA, yet)
- IPv6 transit triggers infrastructure issues
- Registry code needs to be able to IPv6 addresses for “glue”
- Most OS’es have IPv6 stacks that “mostly” work
Moving targets

- Min UDP packet size differences – 512 vs 1280
- EDNS0 support in the servers
- UDP fragmentation and TCP rollover
- Source Address selection
Bad Things

• thinking locally (local optimizations)
  – hardcoding IPv4 assumptions in:
    • firewalls – e.g. PIX
    • proxies
    • load balancers
    • layer 2 fabric (MAC/IP tables)
    • buffering

• Tree consistency / Dual Stack

• Mapped addresses / LinkLocal addresses

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Testbed Interoperability (not always v6…)  

- RFC 2535 vs DS vs ???  
- Supported RR type behaviour  
- Slaves and Caching
And the winner is:

- Most issues appear to be known.
- Spec is mostly stable
- fast, edns0 capable code is becoming available.
- a draft recommendation to ICANN/DoC for formally augmenting the roots with IPv6 transport is being circulated.
- Many TLDs are already running IPv6 enabled servers
Mind the gap

• Registration Software not broadly capable for v6 registration
• DNS evolution has embraced/accommodated IPv6
• deployed infrastructure is non-IPv6 “friendly”
• IPv6 DNS will appear sporadic, less stable due to local optimizations for IPv4, common case capabilities, e.g. firewalls, proxy DNS servers, load balancers.
• These “landmines” must be eradicated for seamless integration of IPv6.
Questions?