

OTDR – IPv6/DNS Symbiosis

Changes to the System

bill manning

bmanning@ep.net

copyright 2003, bill manning

Lemas

- IPv6 is fundamentally a different protocol than 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”?

Rough Draft

- 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
- 2003, Testbed has root, INT, ARPA, MIL, GOV, COM, NET, JP, FR, KR, NL, SE, DE, CN tlds.
- 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

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?