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Comparison of IPv6 Transition Technologies for IPv4aaS

draft-Imhp-v6ops-transition-comparison-02

Document Goal

“To provide operators with an unbiased reference document that assists their assessment of which IPv4aaS technology is the most appropriate for their requirements.”

Demystify the IPv4aaS Mess

Focus on the most popular technologies:

- 464XLAT
- DS-Lite
- Lw4o6
- MAP-E
- MAP-T

Ignoring the least popular methods:

- 4over6
- 4rd
- LISP
- GREoIPv6

Document Sections

- Technology overview and basic comparison.
- High level architecture of each technology.
- IPv4 address sharing methods.
- Detailed analysis.
 - Highlight the differences between each technology.
 - Identify currently available support.
 - Highlight possible regulatory concerns.

Key Points Discussed

- IPv4 Address Sharing
 - Location of NAPT44.
 - Tradeoff between port number efficiency and stateless operation.
 - Regulatory logging requirements and support.
 - Inbound “server” support.
- Performance / Scalability
 - Stateful vs Stateless.
 - Load sharing / Anycasting.
- Typical Deployments
- Provisioning Options
- Security Considerations
 - Code Size.

Changes since -01

- Ian Farrer joined as an author.
- Additional details and figures were added to the description of the five IPv4aaS technologies.
- Restructured the description of the five IPv4aaS technologies and moved to a separate section.
- Completely rewritten the "High-level Architectures and their Consequences" section.
- Several additions and clarification throughout the "Detailed Analysis".

Additional Work

- Performance & scalability measurements
 - Using methodology defined by RFC 8219
 - Implementation of a stateless NAT64 Tester in DPDK is in progress
 - We are looking for volunteers for implementing RFC 8219 compliant software testers for other technologies
- Security Analysis.
 - Using the methodology defined by:
 - G. Lencse and Y. Kadobayashi, "Methodology for the identification of potential security issues of different IPv6 transition technologies: Threat analysis of DNS64 and stateful NAT64", *Computers & Security* (Elsevier), vol. 77, no. 1, pp. 397-411, August 1, 2018, DOI: 10.1016/j.cose.2018.04.012
 - Free version is available: <http://www.hit.bme.hu/~lencse/publications/ECS-2018-Methodology-revised.pdf>
- Add a “Legacy Technologies” section outlining reasons for discounting them.
 - 4over6, 4rd, LISP , GREoIPv6, etc.
- Your suggestions?