Deployment Considerations for Dual-stack Lite

IETF 80 Prague

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DS-lite Deployment Considerations

- Based on preliminary experimental deployment, this work describes deployment and operational considerations for DSLITE.
- Updated -01 version based on comments and feedback.

Interface Considerations

- It is recommended that the AFTR addressing architecture should consist of two individual interfaces (i.e. one dedicated for IPv4 and one dedicated for IPv6) to segregate the functions.
- This can simplify netflow accounting and other OSS tools.

Lawful Intercept Considerations

- Interception in DS-lite architecture must be performed within the AFTR itself.
  - Subjects can be uniquely identified by the IPv6 address assigned to the B4 element.
  - Operators must associate the B4's IPv6 address and the public IPv4 address and port used by the subject.

Logging @ AFTR

- AFTR must log the B4's IPv6 address and the IPv4 information. There are two types of logging that must be done:
  - Source-specific log – AFTR must timestamp and log the B4's IPv6 address, transport protocol, source IPv4 address after NAT-ing, and source port.
  - Destination-specific log –AFTR must timestamp and log the B4's IPv6 address, transport protocol, source IPv4 address after NAT-ing, source port, destination address and destination port.

Blacklisting a shared IPv4 address

- To deal with blacklisting a public IP address the server must no longer rely solely on the IP address to identify a particular user.
  - Server should combine information stored in transport layer (e.g. source port) and application layer (e.g. HTTP) to identify an a particular user.
  - I.D.boucadair-intarea-nat-reveal-analysis

AFTR Policies

- Outgoing Policy
  - Should be implemented on the AFTR's IPv6 interface.
  - May be enforced on a specific B4 (or set of) basis
- Incoming Policy
  - Should be implemented on the AFTR's IPv4 interface.
  - Should be general enough to be applied for all B4s.

Placement of AFTR

- Model One
  - Deploy in the edge and closer to the B4 elements.
  - Cover smaller region
- Model Two
  - Deploy in core of the network and further away from the B4 elements
  - Cover larger region

Model One

- Closer to the B4 elements.
- Serve fewer B4 elements.
- Lower resource requirements for AFTR.
- Tunnel is shorter which is good for the traffic distribution.
- It requires more AFTRs.
- It requires IPv4 access close to the edge.

Model Two

- Further away from the B4 elements.
- Serve more B4 elements.
- Higher resource requirements for AFTR.
- Tunnel is longer and v4 traffic would aggregate in the v6 access network to the AFTR.
- It requires fewer AFTRs.
- The network south of AFTR can be v6-only.

Geo-location Aware Applications

- The IPv4 address alone can't tell where the B4 element is.
- Application may rely on information in the application layer or GPS information to locate the user.

Port Forwarding Considerations

- Some applications require accepting incoming UDP or TCP traffic.
- Some applications rely on ALGs, UPnP IGD, or manual port configuration. Port Control Protocol (PCP) [I-D.ietf-pcp-base] is designed to address these issues.

DS-Lite Tunnel Security

- Limiting services offered by AFTR to registered customers
  - Approach to perform IPv6 ingress filter on the AFTR's tunnel interface to accept only the IPv6 address range in the filter requires a priori knowledge of IPv6 prefix to configure filter.
  - One alternative approach is use DHCPv6 Leasequery [RFC5007]. AFTR uses leasequery when it receives packet from unknown (new) prefix to verify it was delegated and assigned to specific client.

Questions for consideration

- AFTR requires IPv4. Should the WG address AFTR in IPv6 only environment? There is an existing draft discussing this:
  - "draft-boucadair-softwire-dslite-v6only-00 "
- Should this draft includes use cases?
  - Fixed line deployment
  - Wireless deployment
  - Etc.

Next Step

- Any questions and suggestions?
- This draft is in the new charter's scope. Could we adopt this as WG document?