Tunnel End-point Discovery

draft-palet-v6ops-tun-auto-disc-03.txt

Tunnel End-point Discovery

IPv6-in-IPv4 Tunnel End-point Discovery

- Is this something we have to provide?
  - A different discussion..
- Scope of the Discovery
  - Only in network of the ISP where the user attaches to
    - "Third party" discovery is out of scope
- Assumptions
  - Must work through a (non-upgraded) NAT/router
  - The user may have his own NAT/router box(es)
  - IP addresses may be private and/or dynamic
- Proposed solutions
  - Well-known unicast address ("anycast") for initial discovery
  - DNS (in forward or reverse tree)
  - DHCP and PPP options
  - SLP

Tunnel End-point Discovery

TEP Discovery - anycast

- Main properties
  - Well-known v4 unicast address ("anycast")
  - Only for initial discovery of the "real" unicast address
  - Typically would not be advertised in eBGP
- Advantages
  - Works through NATs, etc. very well
  - Seems to work based on DNS root anycast and 6to4 anycast
- Disadvantages
  - ISPs need to be careful in filtering the prefix to prevent hijacks
    - Applies to those ISPs who provide the service
  - Routing operations may be more difficult e.g. in enterprises than changing DNS

Tunnel End-point Discovery

TEP Discovery - forward DNS

- Main properties
  - Use of DNS search path to discover _v6tc.example.com
  - DNS search path learned through DHCP, etc.
- Advantages
  - Adding the tunnel server requires just inserting an A record
- Disadvantages
  - NAT boxes w/ DHCP pool have to pass through the search path
  - Forward DNS search path and topology do not always map well
  - If no search path, the queries might end up at the root servers

Tunnel End-point Discovery

TEP Discovery - reverse DNS

- Main properties
  - Define a new "TEP" record
  - Prepopulate all the IP addresses of potential clients with the record
    - "1.2.3.4.in-addr.arpa. IN TEP v6tc.example.com"
  - The clients would look up TEP record of their own IP address
- Advantages
  - Maps well to the topology
- Disadvantages
  - Assumes prepopulation of the whole IP address space
    - DNS operations pain unless the IP address space mgmt scripts can be modified?
  - Assumes that all RFC1918 space is also prepopulated
    - and the box is not authorative for RFC1918
  - It takes a while to develop a new RR type.

Tunnel End-point Discovery

TEP Discovery - DHCP or PPP

- Main properties
  - Define a new DHCPv4 or PPP option to carry the information
- Advantages
  - DHCPv4 options are easily defined, "de facto" config method
- Disadvantages
  - Does not work through non-upgraded NAT/router boxes
  - Sufficient number of users don’t run DHCP or PPP
    - Would have to define multiple options
  - There has been resistance to new PPP options

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TEP Discovery - SLP

- Main properties
  - Use Service Location Protocol
- Advantages
  - Not really any, except the spec is out there...
- Disadvantages
  - Multicast cannot be assumed, so a Directory Agent needed
  - Then, configuring the address of DA is a problem (e.g. DHCP)
    - Back to square one..

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TEP Discovery - Summary/Discussion

- If this must work through non-upgraded NAT boxes..
  - DHCP and PPP are non-starters
  - Forward DNS may have issues, are these serious enough?
- What's left?
  - Well-known unicast address
  - Reverse DNS prepopulation
  - Manual configuration.. (obviously)
- Where to go next?