DNS Server Selection on Multi-Homed Hosts

draft-savolainen-mif-dns-server-selection-03

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Advanced multi-homed hosts

- Are connected and using multiple networks at the same time (over WLAN, cellular, VPN..)
- Some of the configured DNS servers may serve non-global information, e.g.
  - Private names for intranet use (e.g. VPN interface)
  - DNS64 synthesized addresses which are only locally valid (e.g. cellular interface)
- Hosts should be able to do forward and reverse DNS queries efficiently

(Note: Microsoft’s Name Resolution Policy Table implements this kind of approach (http://technet.microsoft.com/en-us/library/ee649207%28WS.10%29.aspx))
Broadband Forum liaison statement

- [https://datatracker.ietf.org/liaison/922/](https://datatracker.ietf.org/liaison/922/) (2010-07-08)
- Quote:”Some IETF efforts that are of special interest to us include:
  - IPv6 multi-homed premises (where the CE router or host is connected to more than one IPv6 service provider); for example, as described in http://tools.ietf.org/html/draft-troan-multihoming-without-nat66-00. Individual technical issues are source address selection policy distribution, route information distribution, and DNS selection policy distribution.

- In BBF’s case different services may be offered on shared IP-connection, e.g. Internet access and sensor networks utilizing private names.

- Sometimes DNS servers may have only private information
The solution proposal in short

- A new DHCPv6 option to inform nodes (hosts or CPEs) about non-global information a DNS server knows about.
- Node shall check for each DNS query if some DNS server is known to have special information regarding the query (matching suffix or prefix).
  - E.g. for resolving "server.example.com" use the DNS server known to have non-global information about "example.com".
- Note: one implementation alternative is to use indirect hints like information from Domain Search List Options (RFC3646) and from "more specific routes" (RFC4191).
New DHCPv6 option for information delivery

- Is similar option for IPv4 needed?
- Preference for selecting the default DNS server?

A DNS server address with information it has particular knowledge about:
- DNS suffix(es) (namespace(s))
- IPv6 prefix for reverse lookups

To be added: two bits for preference (like in RFC4191):
- 01 High
- 00 Medium (default)
- 11 Low

This version has been implemented by NTT
Feedback from DNSOP WG

- It is OK for MIF WG to work on this topic
- No need to change DNS itself were detected
- DNSOP is happy to follow the work, and comment and review MIF WG document later on

Some concerns:
- Consideration whether the solution is enough to solve the whole problem
- DHCPv4 option should be essentially the same (if defined)
- Scalability concern(?)
- Concern on how many prefixes/suffixes for one DHCPv6 option instance
- Should there be a suffix for "all information" (e.g. ".", or "*", or something)
- How about APIs?

( I may have missed some feedback – will check from the audio recordings )
Proposal for MIF WG

- DNS resolution issues are being described in MIF WG document (@IESG):
  - Also in draft-cao-mif-analysis-01

- Proposal for new charter:
  - Advanced DNS server selection solution: a specification for describing a way for a network to communicate to nodes information required to perform advanced DNS server selection needed for multi-homing and split-DNS scenarios. The specification shall describe the information to be delivered and the protocol for delivering.
  - Nov 2010: Initial WG draft on DNS server selection solution
  - Nov 2011: Submit DNS server selection solution to IESG for publication as a Proposed Standard RFC

- Request to adopt this document as a WG document (once charter allows)