DHCPv4 Leasequery by relay agent remote ID
draft-kurapati-dhc-query-by-remote-id-01.txt

DHC Working Group

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Motivation

- Existing Leasequery mechanism is data driven:
  - Leasequery can be initiated only when Access Concentrator receives data
  - Results in increased Service outage time for the clients.
- Getting consolidated lease information per connection is not possible:
  - Multiple clients can reside in a given connection/circuit and existing mechanism doesn't provide any methods to get consolidated lease information for all the clients belonging to a connection/circuit.
  - Because Access concentrator can not get the consolidated lease information,
    - Complete anti-spoofing filters can not be installed and so anti-spoofing is done in control plane (slow path)
    - Negative caching is suggested by RFC 4388. Negative Caching consumes lot of resources under spoof attacks.

Why Query by remote-id?

- Remote-id identifies a connection/circuit uniquely.
  - Remote ID is globally unique
- Remote-id can be trusted as they are created by Relay Agent.
- Access Concentrator need not wait for the traffic to arrive and can generate LeaseQuery as soon as it comes up after a reboot.
- DHCP Server can provide consolidated Lease Information for a specific connection/circuit.
- Once all the lease information for a given connection/circuit is obtained, anti-spoofing can be done in data plane (fast path).
- No need for Negative Caching.

Change between 00 and 01

- Query by circuit-id has been removed as query by circuit-id does not provide any advantage over query by remote-id. Also circuit-id alone is not sufficient and need either giaddr or subnet selection option etc. to do the lookup.

Why we still need query by remote-id?

- With DHCPv4 Bulk Lease Query, we still need query by remote-id for following reasons:
  - Query by remote-id can be easily extended to Layer 2 Relay Agent which can not use TCP based Bulk Lease Query
  - There may be some networks where DHCP servers may not be migrated to support TCP but the lease query solution is still required. Query by remote-id will be useful in such cases..

Next Step

- Review in Working Group Mailing List
- Working Group Item?

DHCPv4 Bulk Lease Query

draft-dtv-dhc-dhcpv4-bulk-leasequery-00.txt

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Why Bulk Lease Query?

- Useful when thousands of binding information may be available.
- Access Concentrator need not wait for the traffic to arrive and can generate Lease Query as soon as it comes up after a reboot.
- DHCP Server can provide consolidated Lease Information.
- Once all the lease information for a given connection is obtained, anti-spoofing can be done in data plane (fast path).
- As the complete lease information is available, outage time for the customers is reduced.
- No need for Negative Caching.

Bulk Lease Query

- Heavily inspired by DHCPv6 Bulk Lease Query.
- Uses a TCP connection between Lease Query client and DHCP server.
- New query types:
  - Query by Relay-DUID
  - Query by remote-id
- Existing query types as defined in RFC 4388 are also supported
- Uses DHCPLEASEQUERY, DHCPLEASEACTIVE, DHCPLEASEUNKNOWN and DHCPLEASEUNASSIGNED as defined in RFC 4388.
- Introduces DHCPLEASEDATA, DHCPLEASEDONE and DHCPLEASEFAIL message types.
- ‘associate-ip’ option is not used.

Query by Relay-DUID

- Typically used when a lease query client wants to fetch all the binding information allocated through a specific Relay Agent.
- Client connects to DHCP server using TCP and sends lease query message identified as DHCPLEASEQUERY. Only relay-id sub-option in Option-82 is populated.
- Server returns DHCPLEASEACTIVE if it has one or multiple binding information satisfying the query. In this message, it sends the lease information for one of the leases.
- Lease information for other bindings are sent with message type DHCPLEASEDATA.
- DHCP server uses DHCPLEASEDONE message to indicate the end of lease information for a specific lease query.

Query by Remote-id

- Typically used when a lease query client wants to fetch all the binding information allocated for a specific connection/circuit.
- Client connects to DHCP server using TCP and sends lease query message identified as DHCPLEASEQUERY. Only remote-id sub-option in Option-82 is populated.
- Server returns DHCPLEASEACTIVE if it has one or multiple binding information satisfying the query. In this message, it sends the lease information for one of the leases.
- Lease information for other bindings are sent with message type DHCPLEASEDATA.
- DHCP server uses DHCPLEASEDONE message to indicate the end of lease information for a specific lease query.

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