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Abstract

In the DNS architecture, two kinds of record types for maintaining host’s IP addresses are supported: one is A type which records IPv4 and AAAA for IPv6 addresses. This document defines a new TYPE, which is mainly used in queries in order to get both IPv4 and IPv6 addresses. The main advantage is to avoid sending several requests in order to resolve the location of a given resource. A single request may be sufficient. The proposed solution does not require the definition of any new record type.
1. Introduction

1.1 Current DNS operation

There are mainly two resource record types to store IP addresses in the DNS system. One is A resource record, the other is AAAA resource record. An A resource record is defined to store an IPv4 address, an AAAA is defined to store an IPv6 address.

1.2 Problem for current IPv6 DNS operation

Due to large-scale applicable for IPv4, it will take a long time to fully transit from IPv4 to IPv6. During the transition period, IPv4 network and IPv6 network will coexist. In most cases, the host will not know whether the address of the other side is IPv4 or IPv6. According to current practices, the host will send an AAAA query first. If there no IPv6 address has been retrieved, then an A query will be issued.

The above mechanism has following disadvantages.
1- It takes longer time to compare with only A or AAAA query which is needed.
2- Both A and AAAA queries will waste bandwidth, especially the air interface bandwidth.
3- More process resources in host and DNS server are needed.

In order to solve the above problems, a new kind of query type is proposed.

2. New query type definition

A new query type mainly used in queries is defined to get all available addresses (including IPv4 and IPv6). It is not intended to create new resource record.

2.1 v4v6 query type

The v4v6 query type is specific to the Internet class.

2.2 v4v6 data format

No new data format is defined. In fact, it is unnecessary to create new data format.

2.3 v4v6 query
A v4v6 query for a specified domain name in the Internet class returns all associated A and AAAA resource records in the answer section of a response.

2.4 Textual format of v4v6 query type

There is no new textual format for v4v6 query type.

3. Modifications to existing query types

All existing query types that perform type A and AAAA processing must be updated to perform type A, type AAAA and v4v6 processing. These definitions mean that a name server must add relevant IPv4 addresses and relevant IPv6 addresses available locally to the response when processing v4v6 queries.

4. Security Considerations

Any information obtained from the DNS must be regarded as unsafe unless there are some new security mechanism. The definition of the v4v6 query type does not change the model for use of these techniques.

So, this specification is not believed to cause any new security problem. Dedicated means to secure DNS communication should be encouraged.

5. IANA Considerations

A record TYPE is to be assigned by IANA.

6. References


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