

Synthesis of Routing Goop and AAAA Records in IPv6

[<draft-ietf-ipngwg-dns-rr-rgadd-00.txt>](#)

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Abstract

This document is a proposal to redefine the existing DNS AAAA resource record into two resource records: an RG record to define the routing topology of an IPv6 address and an aAA record to define the End System Identifier of an IPv6 address. The document will define the synthesis of the RG and aAA record at the DNS primary server, which will return an AAAA record to DNS resolvers. The objective of this work is to split the AAAA record in the DNS into location and identifier to provide future capabilities for dynamic renumbering of addresses. This work was spawned by the GSE - Alternate Addressing Architecture Proposal for IPv6.

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1. Introduction

This document is a proposal to redefine the existing DNS AAAA resource record [[3](#),[4](#)] into two resource records: an RG record to define the routing topology of an IPv6 address and an aAA record to define the End System Identifier of an IPv6 address. The document will define the synthesis of the RG and aAA record at the DNS primary server, which will return an AAAA record to DNS resolvers. The objective of this work is to split the AAAA record in the DNS into location and identifier to provide future capabilities for dynamic renumbering of addresses. This work was spawned by the GSE - Alternate Addressing Architecture Proposal for IPv6 [[5](#)].

The design objective of these two record types is to make it transparent to existing DNS resolvers and the DNS protocol used to query for AAAA records.

This proposal is dependent on the IPng WG buying into new definitions via a new addressing architecture proposal, support for clear boundaries for an end system identifier, and the definition of the routing goop to define location for the end system identifier. Upon completion of that work in the WG if it moves forward the author can finish this specification where "???" and "TBD" exists presently.

2. Terminology and Definitions

node	- A device that implements IPv6.
interface	- A node's attachment to the link.
address	- An IP layer identifier for an interface or a set of interfaces.

3. New Resource Record Definitions

Two new record types are defined to store a node's IPv6 address. A node that has more than one IPv6 address must have more than one such record or record combinations.

3.1 aAA record type

The aAA resource record type is a new record specific to the Internet class that stores a single IPv6 address for a nodes interface. It is an ESD as defined in TBD.

The value of the type is TBD (decimal).

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[3.2](#) RG record type

The RG resource record type is a new record specific to the Internet class that stores a single IPv6 address for a nodes location within a routing domain. It is RG as defined in TBD.

The value of the type is TBD (decimal).

[3.3](#) aAA data format

A ??? bit IPv6 ESD address is encoded in the data portion of an aAA resource record in network byte order (high-order byte first).

[3.4](#) RG data format

A ??? bit IPv6 RG address is encoded in the data portion of an RG resource record in network byte order (high-order byte first).

[3.5](#) AAAA query

An AAAA [[1](#),[2](#),[4](#)] query for a specified domain name in the Internet class returns all associated AAAA resource records in the answer section of a response. The DNS primary server [[2](#)] will synthesize the RG and aAA records to produce an AAAA record in the answer section of the response for a query for an AAAA record.

A type AAAA query does not perform additional section processing.

[3.6](#) Textual format of aAA and RG records

The textual representation of the data portion of an aAA and RG resource record used in a master database file is the textual representation of a IPv6 address as defined in [3 + update for aAA and RG TBD].

[4.](#) Modifications to existing Query Types

Query processing as defined for AAAA records [[4](#)] would continue to be processed as defined presently for IPv6. The DNS primary server would be responsible for concatenating the RG and aAA records to respond to an AAAA query from resolvers. There may be multiple RG's

defined for each aAA record, and in those cases the DNS primary server after synthesis of RG's to a specific aAA record must return multiple AAAA record types in the answer section of a query response for AAAA records.

The exception for the present AAAA records as defined is the IP6.INT

domain. The IPng WG at present is discussing a new methodology to obtain addresses for names in a query but use of an ICMP message to determine the name for an address. This needs further investigation to determine it if has an affect on AAAA records.

But the same synthesis of RG + aAA records can be done for the reverse address requirement for DNS PTR records [2], to process AAAA reverse lookups in the DNS.

5. Security Considerations

Security issues are not discussed in this memo.

Acknowledgements

The attendees at the IPng Interim WG meeting to review the GSE proposal at Sun Microsystems in Palo Alto, CA on February 27/28, 1997.

References

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