

**IP Location Load Balancing Resource Record
draft-sonoda-dnsop-lb-01**

Abstract

This document defines a new DNS load balance function that is able to transfer information in zone transfer and not need online signing. DNS base load balance is popular technology. It provides weight base response and location base response. It have become an indispensable part of traffic engineering. However, DNS base load balance can't transfer load balance information in zone transfer and need online signing because it is not standardized. This document defines a new DNS resource record called "LB". LB RR provides the balancing information weight, location and target domain name.

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1. Introduction

1.1. Current DNS load balancing

Current DNS load balancing provides traffic engineering. It uses special authoritative name server. Its response is one address record that is dynamic changes using network location and weight. It's used for large traffic WEB site domain name that is important domain name. Important domain name should be secure.

But Current DNS load balancing is not secure. Because Current DNS load balancing can't send zone data by zone transfer. It's mean very difficult to use multi service providers. That means weak for DDoS Attack. If zone is signed, All name servers require private key for dynamic signing because response is dynamic changes. Distributing private key is not secure, It is increased risk of leakage private key.

1.2. Propose new DNS load balancing

Propose new DNS load balancing concept is that Authoritative name server uses "LB" RR to provide load balancing information and Clients application uses "LB" RR to select target name.

"LB" RR defines load balancing settings that is network location and weight and target domain name. Network location is string that meaningful name of network. For example Country code (ex. JP), subdivision code (ex. US-CA) and Autonomous System Number (ex. AS65536). Weight is ratio value to use select target name. Target name is pointer to address record.

"location.server" is special TXT record that is location information at full service resolver. Application can use this value for location selection.

2. The LB Resource Record

The LB RR has mnemonic LB. LB RR define load balancing information.

LB format below.

```
<owner> <ttl> <class> LB <weight> <location> <target>
```


The format is not class-sensitive. All fields are required.

<weight> field is a 2 octets, 1 or more natural number.

<location> field is a "<character-string>" [[RFC1035](#)].

<target> field is a "<domain-name>" [[RFC1035](#)].

2.1. Define location

<location> ::= "*" | <continental code> | <country code> |
<subdivision code> | <asn code> | <private code>

<region code> ::= "AF" | "NA" | "AS" | "EU" | "NA" | "OC" | "SA"

<country code> ::= ISO 3166-1 alpha-2 Country code.

<subdivision code> ::= ISO 3166-2 Codes for the representation of
names of countries and their subdivisions.

<asn code> ::= "AS" <asn> [":" <asn>]

<private code> ::= "+" <let>

<ans> ::= <nonzero digit> <digit>

<nonzero digit> ::= any one of the ten digits 1 through 9

<digit> ::= any one of the ten digits 0 through 9

<let> ::= any one of the 26 alphabetic characters A through Z in
upper case or any one of the ten digits 0 through 9.

2.2. Record example

```
example.jp. 3600 IN LB 1 * www.example.com. ; for any region
example.jp. 3600 IN LB 1 AS as.example.com. ; for ASIA region
example.jp. 3600 IN LB 1 JP jp1.example.jp. ; for JP region, weight 1
example.jp. 3600 IN LB 3 JP jp2.example.jp. ; for JP region, weight 3
example.jp. 3600 IN LB 1 JP-13 tokyo.example.jp. ; for tokyo region
example.jp. 3600 IN LB 1 AS2496 as65536.example.jp. ; for AS2496
example.jp. 3600 IN LB 1 AS2496:1 as65536.example.jp. ; for AS2496
example.jp. 3600 IN LB 1 +BEER beer.example.jp. ; private use
```

3. Full service resolver's location

"location.server" is special TXT record that is locations at full service resolver. Locations in order of priority location that resolver administrator like it. Application can use it for selecting location.

3.1. Record example

```
location.server 0 CH TXT "AS2479" "JP-13" "JP" "AS" "*" 
```

4. IANA Considerations

IANA is requested to assign a DNS RR data type value for the LB RR type under the "Resource Record (RR) TYPES" sub-registry under the "Domain Name System (DNS) Parameters" registry.

5. Normative References

[RFC1035] Mockapetris, P., "Domain names - implementation and specification", STD 13, [RFC 1035](https://www.rfc-editor.org/info/rfc1035), DOI 10.17487/RFC1035, November 1987, <<https://www.rfc-editor.org/info/rfc1035>>.

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