ID/LOC MAPPING SYSTEM BASED ON REGISTRIES DATABASES

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Abstract

The Internet today is facing a scalability problem in it default free Zone (DFZ) and Identifier and locator split (Id/loc)) have been proposed as a solution. As for all Id/Loc split protocol a mapping system is required to bind the identifiers to their locators. Locator and identifier Separation Protocol (LISP) a network based of id/loc split approach provide scalability of the mapping system through aggregation of identifiers by edge router. Due to location update during entity movement the reaggregation causes a high latency between mapping system component at the same time with scalability concern in case reaggregation is impossible. In this paper we propose a mapping system based on registries allocation with an update scheme to reduce latency.

Ⅰ. Introduction

The alarming growth of the DFZ [2] of the routing system has been the cause of the scalability problem of the internet. The usage of a single namespace to express the identity and the location of an entity has been the root of the current scalability problem. Separating theses two functions have been discussed for many years as a way of reducing the DFZ size. The Id/Loc will provide along with the DFZ scalability several other advantages like multihoming, ingress traffic engineering, provider independent addresses etc. Id/Loc split gives to entity the ability to change locators without changing their identity as long as the mapping system is informed about the new locator.

So far scalability of mapping system depends on the aggregation made at the lowest level If the aggregation is not possible then the mapping size grows and affects the scalability of the global mapping system [1]. And the updates about hosts and their new locators have to be spread to the all mapping system, which can cause high signaling cost.

In this paper we introduce mapping system architecture and an update procedure which will offer scalability and robustness to the mapping system.

Ⅱ. Proposed Scheme

The proposed mapping system is based on Internet Protocol (IP) today assignment model. The mapping information is distributed in a hierarchical manner from the top regional Internet registry (RIR) to the bottom at the End Users network. Each registry holds a database and is identified by a locator which is globally routable. The real mapping system is stored at the edge of the network. As shown in fig1 the mapping architecture is made of:

Global Database Servers: they hold all the identifiers space allocated to Local registries each mapped to their database server locator in charge of their management. Regional registries shares this global information and update it each time a new space is allocated to a new local registry or added to an existing one.

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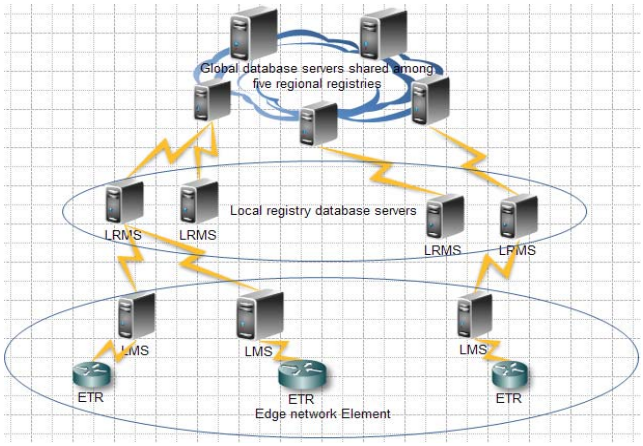

Figure1 Mapping architecture.

Local Registry Mapping Server (LRMS): Have two tables, one holding the global database information downloaded after registration and the other, which is the main table, holds the identifiers space assigned to end users network by local registry based on the space under its management.

Local Mapping Server (LMS): Download from it authoritative LRMS the main table of LRMS. The main table is made of identifier-to- locator, which constitute the real mapping information received from ETR. It is in charge of replying to map-request when mapping information is found

The supplementary table at the LMS allows keeping the transaction locally, avoid long request and facilitates update procedures.

To reduce updates signals which affect the entire mapping system, we propose an update procedure as follow.

When an Egress Tunnel Router (ETR) sends updates to LMS, if LMS notice Identifiers which does not belong to it, it checks in the second table about the authoritative LMS in case the host is in the same local registry. If yes the update is sent to the concerned LMS and saved. If not the update will be forward to the visited authoritative LRMS which will forward it to the visitor LRMS and then to LMS which will save the update.

The idea is to keep mapping information at the authoritative LMS even when a location change has happened, this prevent from updating the higher level.

This architecture and its update procedure provide advantages such as:

Robustness: Each edge network manages it own mapping information. Hosts RLOC retrieval process does not involves the all mapping system in the contrary only the concerned elements are used same as for the location update process. This gives to other components of the mapping system autonomy and latency reduction because they don't receive update signaling when they are not concerned.

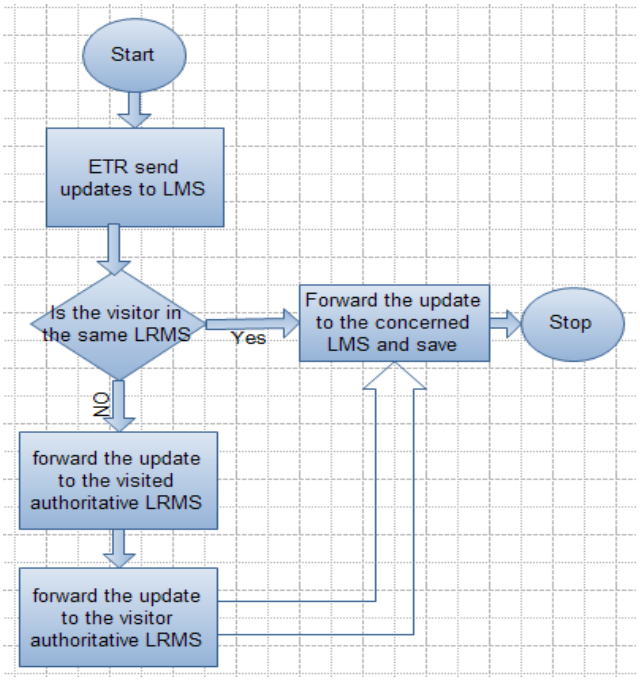

Figure2 Location update flowchart

Scalability: The scalability is ensured by the hierarchical model used. The higher levels are made of pointers of identifiers toward the servers used for their management while the edge components are the one holding the mapping information.

III. Conclusion

In this paper we have proposed mapping system architecture with its components based on registries IP allocation model. We have shown the location update scheme for more robustness and scalability. As future work mobility will be considered and the location update to avoid reaggregation management discussed and evaluated.

Reference

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