Dynamic Hostname Exchange Mechanism
for IS-IS

1. Introduction

IS-IS uses a 1-8 byte system ID (normally 6 bytes) to represent a node in the network. For management and operation reasons, network operators need to check the status of IS-IS adjacencies, entries in the routing table and the content of the IS-IS link state database. It is obvious that, when looking at diagnostics information, hexadecimal representations of systemIDs and LSP identifiers are less clear than symbolic names.

One way to overcome this problem is to define a name-to-systemID mapping on a router. This mapping can be used bidirectionally. E.g., to find symbolic names for systemIDs, and to find systemIDs for symbolic names. One way to build this table of mappings is by static definitions. Among network administrators who use IS-IS as their IGP it is current practice to define such static mappings.

Thus every router has to maintain a table with mappings between router names and systemIDs. These tables need to contain all names and systemIDs of all routers in the network.
There are several ways one could build such a table. One is via static configurations. Another scheme that could be implemented is via DNS lookups. In this document we propose a third solution. We hope the proposed solution is easier and more manageable than static mapping or DNS schemes.

2. Possible solutions

The obvious drawback of static configuration of mappings is the issue of scalability and maintainability. The network operators have to maintain the name tables. They have to maintain an entry in the table for every router in the network. They have to maintain this table on each router in the network. The effort to create and maintain these static tables grows with the total number of routers on the network. Changing the name or systemID of one router, or adding one new router introduced will affect the configurations of all the other routers on the network. This will make it very likely that those static tables are outdated.

Having one table that can be updated in a centralized place would be helpful. One could imagine using the DNS system for this. A drawback is that during the time of network problems, the response time of DNS services might not be satisfactory or the DNS services might not even be available. Another possible drawback might be the added complexity of DNS. Also, some DNS implementations might not support A and PTR records for CLNS NSAPs.

A third way to build dynamic mappings would be to use the transport mechanism of the routing protocol itself to advertise symbolic names in IS-IS link-state PDU. This document defines a new TLV which allows the IS-IS routers to include the name to systemID mapping information in their LSPs. This will allow simple and reliable transport of name mapping information across the IS-IS network.

3. The Dynamic Hostname TLV

The Dynamic hostname TLV is defined here as TLV type 137.

LENGTH - total length of the value field.

VALUE - a string of 1 to 255 bytes.

The Dynamic hostname TLV is optional. This TLV may be present in any fragment of a non-pseudo node LSP. The value field identifies the symbolic name of the router originating the LSP. This symbolic name can be the FQDN for the router, it can be a subset of the FQDN or any string operators want to use for the router. The use of FQDN or a
subset of it is strongly recommended. The content of this value is a
domain name, see RFC 2181. The string is not null-terminated. The
systemID of this router can be derived from the LSP identifier.

If this TLV is present in a pseudo node LSP, then it should not be
interpreted as the DNS hostname of the router.

4. Implementation

The Dynamic Hostname TLV is optional. When originating an LSP, a
router may decide to include this TLV in its LSP. Upon receipt of an
LSP with the dynamic hostname TLV, a router may decide to ignore this
TLV, or to install the symbolic name and systemID in its hostname
mapping table.

A router may also optionally insert this TLV in it’s pseudo node LSP
for the association of a symbolic name to a local LAN.

5. Security Considerations

This document raises no new security issues for IS-IS. However, it is
couraged to use authentications for IS-IS routing protocol. The
authentication mechanism for IS-IS protocol is specified in [1] and
it is being enhanced within IETF in [2].

6. Acknowledgments

The authors would like to thank Enke Chen and Yakov Rekhter for their
comments on this work.

7. References

information exchange protocol for use in conjunction with the
Protocol for providing the Connectionless-mode Network Service

8. Authors’ Addresses

Naiming Shen
Siara Systems, Inc.
1195 Borregas Avenue
Sunnyvale, CA, 94089
EMail: naiming@siara.com

Henk Smit
Cisco Systems, Inc.
170 Tasman Drive
San Jose, CA, 95134
EMail: hsmit@cisco.com
9. Full Copyright Statement

Copyright (C) The Internet Society (2000). All Rights Reserved.

This document and translations of it may be copied and furnished to
others, and derivative works that comment on or otherwise explain it
or assist in its implementation may be prepared, copied, published
and distributed, in whole or in part, without restriction of any
kind, provided that the above copyright notice and this paragraph are
included on all such copies and derivative works. However, this
document itself may not be modified in any way, such as by removing
the copyright notice or references to the Internet Society or other
Internet organizations, except as needed for the purpose of
developing Internet standards in which case the procedures for
copyrights defined in the Internet Standards process must be
followed, or as required to translate it into languages other than
English.

The limited permissions granted above are perpetual and will not be
revoked by the Internet Society or its successors or assigns.

This document and the information contained herein is provided on an
"AS IS" basis and THE INTERNET SOCIETY AND THE INTERNET ENGINEERING
TASK FORCE DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING
BUT NOT LIMITED TO ANY WARRANTY THAT THE USE OF THE INFORMATION
HEREIN WILL NOT INFRINGE ANY RIGHTS OR ANY IMPLIED WARRANTIES OF
MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Acknowledgement

Funding for the RFC Editor function is currently provided by the
Internet Society.