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Format for using PIM proxies
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Status of this Memo

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Abstract

This document describes a generic TLV encoding format to be added to PIM.

Table of Contents

1. Introduction 3
2. Use of the Proxy Field in Join Messages 3
2.1 Proxy join 3
2.2 Transitive proxies 3
2.3 Proxy Hello Option 3
2.4 Conflicting Proxies 3
2.5 Proxy Convergence 4
2.6 Multiple Proxies 4
3. PIM Proxy packet format 5
3.1 PIM Join packet format 5
3.2 PIM Proxy Hello option 5
4. Acknowledgments 6
5. References 6
5.1 Normative References 6
5.2 Informative References 6
Authors' Addresses 6
Intellectual Property and Copyright Statements 7

1. Introduction

It is sometimes convenient to add additional information to PIM join messages. The generic PIM encoding format is not allways optimal todo this. This document defines a new field in the PIM Join message, called the "Proxy" field. The contents and purpose of this proxy field is not outside the scope of this document, only the generic encoding format is described here.

2. Use of the Proxy Field in Join Messages

2.1 Proxy join

Proxy fields are defined similar to the PIM source encoding type as defined in [I-D.ietf-pim-sm-v2-new]. A source address without any additional TLV's should be processed identically to a source address in the default source encoding.

Multiple TLV's from the same or different type are permitted in a single source address in any order.

2.2 Transitive proxies

It may be desired to have routers that understand the generic proxy format, forward the proxies regardless if they understand the TLV's encoded in the proxy not. For this the first bit in the Type field is reserved. If this bit is set then the TLV is forwarded upstream in case the router does not understand that type.

2.3 Proxy Hello Option

A new PIM source type has been defined to include the Proxy field. This source type is included in a normal PIM Join. Each router on a connected network needs to be able to understand and parse the Join message. Therefore we include a new PIM hello option to advertise our capability to parse and process the new source type. We can only send a PIM Join which includes a Proxy if ALL routers on the network support the new option. (Even a router which is not the upstream neighbor must be able parse the packet in order to do Join suppression or overriding.) Option value TBD.

2.4 Conflicting Proxies

It's possible that a router receives conflicting proxy information from different downstream routers. See Figure 2.

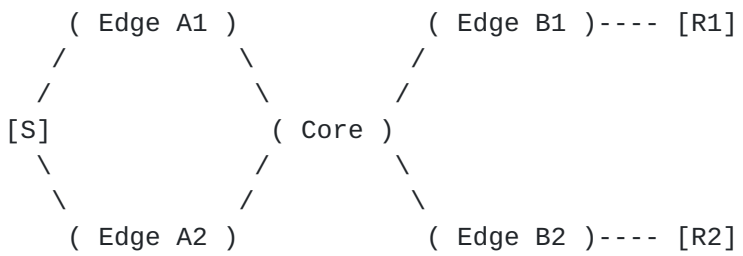


Figure 2

There are 2 receivers for the same group connected to Edge B1 and B2. Suppose that edge router B1 prefers A1 as the exit point and B2 prefers A2 as exit point to reach the source S. If both Edge B1 and B2 send a Join including a Proxy to prefer their exit router in the network and they cross the same core router, the core router will get conflicting proxy information for the source. If this happens we use the Proxy from the PIM adjacency with the numerically smallest IP address. The Proxies from other sending routers may be kept around in case the best Proxy gets pruned or expires, we are able to immediately use the second best Proxy and converge quickly without waiting for the next periodic update. If a TLV has its own definition for conflict resolution is is preferred over the conflict resolution above.

2.5 Proxy Convergence

A Proxy is included in a PIM Join message together with the source information. If the Proxy for this source is changed, we trigger a new PIM Join message to the upstream router. This causes the new Proxy to be propagated. This new Proxy implicitly removes the old Proxy upstream. If processing the new Proxy results in a change in the distribution tree, a PIM Prune message may be sent. This PIM Prune does not need to carry any Proxy, the sender of the prune and the source and group information is enough to identify the entry. The proxy information is removed immediately and possibly a new proxy is chosen from the database if available.

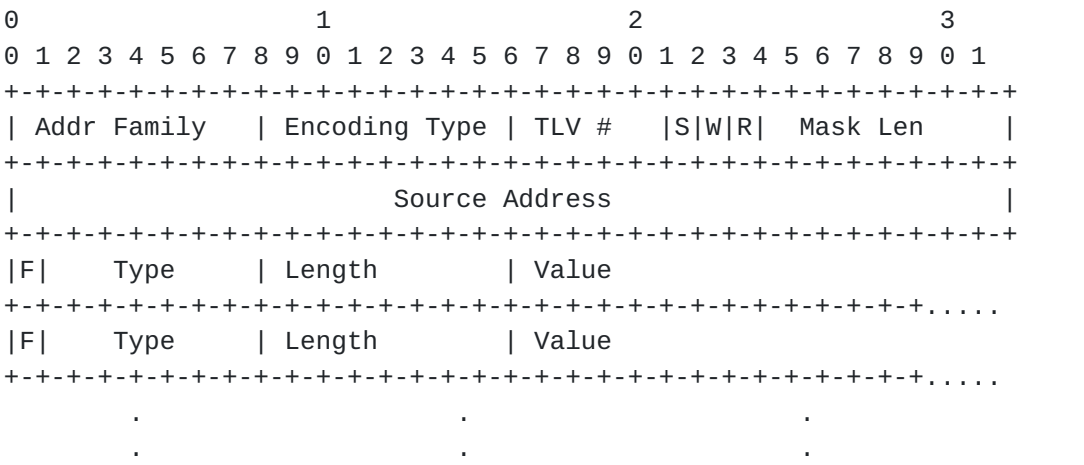
2.6 Multiple Proxies

A PIM Join can contain multiple Proxies. The Proxies are encoded as TLVs associated with a new PIM source type in the PIM message. When a PIM Join with multiple Proxies is received, the first Proxy is processed, and the action taken depends upon the Proxy type. This may or may not result in the processing of the next Proxy. Proxies not processed are passed upstream unchanged.

3. PIM Proxy packet format

3.1 PIM Join packet format

There is no space in the default PIM source encoding to include a Proxy field. Therefore we introduce a new source encoding type. The proxies are formatted as TLV's. The new Encoded source address looks like this:



TLV # gives the number of TLV's that are included with this source. With the 5 bits we can include a maximum of 31 TLV's

F bit, Forward Unknown TLV bit. If this bit is set the TLV is forwarded regardless if the router understands the Type.

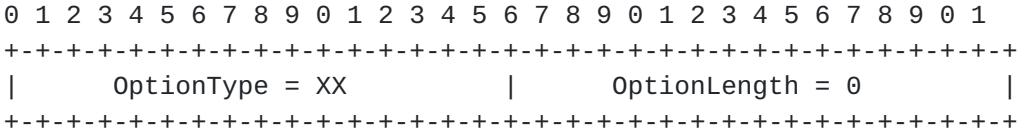
Type field of the TLV is 7 bits.

Length field of the TLV is 1 byte.

The other fields are the same as described in the PIM spec. [I-D.ietf-pim-sm-v2-new].

The source TLV encoding type: TBD.

3.2 PIM Proxy Hello option



Option type: TBD.

4. Acknowledgments

The authors would like to thank James Lingard for his comments on this topic.

5. References

5.1 Normative References

[I-D.ietf-pim-sm-v2-new]
Fenner, B., Handley, M., Holbrook, H. and I. Kouvelas, "Protocol Independent Multicast - Sparse Mode PIM-SM): Protocol Specification (Revised)", Internet-Draft draft-ietf-pim-sm-v2-new-11, October 2004.

5.2 Informative References

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