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OSPF extensions to advertise S-BFD Target Discriminator
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Abstract

This document defines a new OSPF Router Information (RI) TLV that allows OSPF routers to flood the S-BFD discriminator values associated with a target network identifier. This mechanism is applicable to both OSPFv2 and OSPFv3.

Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119 [RFC2119].

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1. Introduction

Seamless Bidirectional Forwarding Detection (S-BFD), specified in [I-D.akiya-bfd-seamless-base], is a simplified mechanism for using BFD with many negotiations eliminated. This is achieved by using unique network-wide discriminators to identify the Network Targets (e.g., IP addresses). These S-BFD discriminators can be advertised by the IGPs, and this document concerns itself with OSPF. Specifically, this document defines a new TLV (named the S-BFD Discriminator TLV) to be carried within the OSPF Router Information LSA ([RFC4970]).

1.1. Relationship between OSPF and S-BFD

This document, implicitly, defines a relationship between OSPF and S-BFD. S-BFD assigns one or more Discriminators to each S-BFD reflector node. OSPF, in turn, learns about these from S-BFD, and floods them in the newly defined TLV. After this information is flooded, it is stored in all the OSPF nodes such that S-BFD initiators can map out target nodes to target Discriminators, and can therefore construct the S-BFD probe.

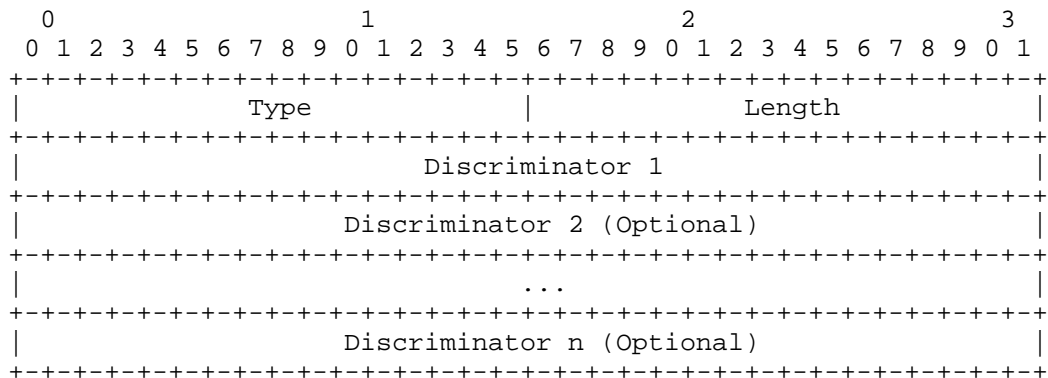
2. Implementation

This extension makes use of the Router Information (RI) Opaque LSA, defined in [RFC4970] , for both OSPFv2 [RFC2328] and OSPFv3 [RFC5340], by defining a new OSPF Router Information (RI) TLV: the S-BFD Discriminator TLV.

The S-BFD Discriminator TLV is OPTIONAL. Upon receipt of the TLV, a router may decide to ignore this TLV or install the S-BFD discriminator in BFD Target Identifier Table.

2.1. S-BFD Discriminator TLV

The format of the S-BFD Discriminator TLV is as follows:



Type - S-BFD Discriminator TLV Type

Length - Total length of the discriminator (Value field) in octets, not including the optional padding. The Length is a multiple of 4 octets, and consequently specifies how many Discriminators are included in the TLV.

Value - S-BFD network target discriminator value or values.

Routers that do not recognize the S-BFD Discriminator TLV Type MUST ignore the TLV. S-BFD discriminator is associated with the BFD Target Identifier type, that allows demultiplexing to a specific task or service.

2.2. Flooding Scope

The flooding scope for S-BFD Discriminator information advertised through OSPF can be limited to one or more OSPF areas, or can be extended across the entire OSPF routing domain.

Note that the S-BFD session may be required to span multiple areas, in which case the flooding scope may comprise these areas. This could be the case for an ABR, for instance, advertising the S-BFD Discriminator information within the backbone area and/or a subset of its attached IGP area(s).

The S-BFD Discriminator TLV is advertised within OSPFv2 Router Information LSAs (Opaque type of 4 and Opaque ID of 0) or OSPFv3 Router Information LSAs (function code of 12), which are defined in [RFC4970]. As such, elements of procedure are inherited from those defined in [RFC4970].

In OSPFv2, the flooding scope is controlled by the opaque LSA type (as defined in [RFC5250]) and in OSPFv3, by the S1/S2 bits (as defined in [RFC5340]). If the flooding scope is area local, then the S-BFD Discriminator TLV MUST be carried within an OSPFv2 type 10 router information LSA or an OSPFv3 Router Information LSA with the S1 bit set and the S2 bit clear. If the flooding scope is the entire IGP domain, then the S-BFD Discriminator TLV MUST be carried within an OSPFv2 type 11 Router Information LSA or OSPFv3 Router Information LSA with the S1 bit clear and the S2 bit set.

When the S-BFD Reflector is deactivated, the OSPF speaker advertising this S-BFD Discriminator MUST originate a new Router Information LSA that no longer includes the corresponding S-BFD Discriminator TLV, provided there are other TLVs in the LSA. If there are no other TLVs in the LSA, it MUST either send an empty Router Information LSA or purge it by prematurely ageing it.

For intra-area reachability, the S-BFD Discriminator TLV information regarding a specific target identifier is only considered current and useable when the router advertising this information is itself reachable via OSPF calculated paths in the same area of the LSA in which the S-BFD Discriminator TLV appears. In the case of domain-wide flooding, i.e., where the originator is sitting in a remote area, the mechanism described in section 5 of [RFC5250] should be used.

A change in information in the S-BFD Discriminator TLV MUST NOT trigger any SPF computation at a receiving router.

3. Backward Compatibility

The S-BFD Discriminator TLV defined in this document does not introduce any interoperability issues.

A router not supporting the S-BFD Discriminator TLV will just silently ignore the TLV as specified in [RFC4970].

4. Security Considerations

This document defines OSPF extensions to distribute the S-BFD discriminator within an administrative domain. Hence the security of the S-BFD discriminator distribution relies on the security of OSPF.

OSPF provides no encryption mechanism for protecting the privacy of LSAs and, in particular, the privacy of the S-BFD discriminator advertisement information. This however is not a concern as there isn't any need to hide the discriminator value that can be used to reach the Reflectors.

5. IANA Considerations

IANA has defined a registry for TLVs carried in the Router Information LSA defined in [RFC4970]. IANA needs to assign a new TLV codepoint for the S-BFD Discriminator TLV carried within the Router Information LSA.

Value	TLV Name	Reference
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TBD	S-BFD Discriminator	(this document)

6. Acknowledgements

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7. References

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