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Seamless Bidirectional Forwarding Detection (S-BFD) for
IPv4, IPv6 and MPLS
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Abstract

This document defines procedures to use Seamless Bidirectional Forwarding Detection (S-BFD) for IPv4, IPv6 and MPLS environments.

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].

Status of This Memo

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1. Introduction

Seamless Bidirectional Forwarding Detection (S-BFD), [I-D.ietf-bfd-seamless-base], defines a generalized mechanism to allow network nodes to seamlessly perform connectivity checks to remote entities. This document defines necessary procedures to use S-BFD on IPv4, IPv6 and MPLS environments.

The reader is expected to be familiar with the IP, MPLS BFD and S-BFD terminologies and protocol constructs.

2. Initiator Procedures

S-BFD packets are transmitted with IP header, UDP header and BFD control header ([RFC5880]). When S-BFD packets are explicitly label switched, the former is prepended with a label stack. Note that this document does not make a distinction between a single-hop S-BFD scenario and a multi-hop S-BFD scenario, both scenarios are supported.

Necessary values in the UDP and BFD control headers are described in [I-D.ietf-bfd-seamless-base]. Section 2.1 describes necessary values in the IP and MPLS headers when an SBFDInitiator on the initiator is sending S-BFD packets.

2.1. Details of S-BFD Packet Sent by SBFDDInitiator

- o Specification common to both IP routed S-BFD packets and explicitly label switched S-BFD packets:
 - * Source IP address field of the IP header MUST be set to a local IP address.
- o Specification for IP routed S-BFD packets:
 - * Destination IP address field of the IP header MUST set to an IP address of the target.
 - * TTL field of the IP header SHOULD be set to 255.
- o Specification for explicitly label switched S-BFD packets:
 - * S-BFD packets MUST have the label stack that is expected to reach the target.
 - * TTL field of the top most label SHOULD be 255.
 - * Destination IP address field of the IP header MUST be set to 127/8 for IPv4 and 0:0:0:0:0:FFFF:7F00/104 for IPv6.
 - * TTL field of the IP header MUST be set to 1.

Ed-Note: Discuss whether we want a new associated channel type for S-BFD.

2.2. Target vs. Remote Entity (S-BFD Discriminator)

Typically, an S-BFD packet will have "your discriminator" field corresponding to an S-BFD discriminator of the remote entity located on the target network node defined by the destination IP address or the label stack. It is, however, possible for an SBFDDInitiator to carefully set "your discriminator" and TTL fields to perform a connectivity test towards a target but to a transit network node.

Section 2.1 intentionally uses the word "target", instead of "remote entity", to accommodate this possible S-BFD usage through TTL expiry. This also requires S-BFD packets not be dropped by the responder node due to TTL expiry. Thus implementations on the responder MUST allow received S-BFD packets taking TTL expiry exception path to reach corresponding reflector BFD session.

3. Responder Procedures

S-BFD packets are IP routed back to the initiator, and will have IP header, UDP header and BFD control header. Necessary values in the UDP and BFD control headers are described in [I-D.ietf-bfd-seamless-base]. Section 3.1 describes necessary values in the IP header when an SBFDRReflector on the responder is sending S-BFD packets.

3.1. Details of S-BFD Packet Sent by SBFDRReflector

- o Destination IP address field of the IP header MUST be copied from source IP address field of received S-BFD packet.
- o Source IP address field of the IP header MUST be set to a local IP address.
- o TTL field of the IP header SHOULD be set to 255.

4. Security Considerations

Security considerations for S-BFD are discussed in [I-D.ietf-bfd-seamless-base].

5. IANA Considerations

No action is required by IANA for this document.

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