

Workgroup: INTAREA

Internet-Draft:

draft-encapsulation-of-san-header-00

Published: 18 August 2022

Intended Status: Standards Track

Expires: 19 February 2023

Authors: L. Ma

D. Zhao

F. Zhou

ZTE Corporation

ZTE Corporation

ZTE Corporation

Encapsulation of SAN Header

Abstract

This document proposes the encapsulation of the SAN header in the IPv6 data plane to carry the SAN related information, which could be used to associate the networking and computing resources indexed by SAN ID and route and forward the service traffic accordingly.

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF). Note that other groups may also distribute working documents as Internet-Drafts. The list of current Internet-Drafts is at <https://datatracker.ietf.org/drafts/current/>.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

This Internet-Draft will expire on 19 February 2023.

Copyright Notice

Copyright (c) 2022 IETF Trust and the persons identified as the document authors. All rights reserved.

This document is subject to BCP 78 and the IETF Trust's Legal Provisions Relating to IETF Documents (<https://trustee.ietf.org/license-info>) in effect on the date of publication of this document. Please review these documents carefully, as they describe your rights and restrictions with respect to this document. Code Components extracted from this document must include Revised BSD License text as described in Section 4.e of the Trust Legal Provisions and are provided without warranty as described in the Revised BSD License.

Table of Contents

- [1. Introduction](#)
- [2. Requirements Language](#)
- [3. Terminology](#)
- [4. The SAN Option](#)
- [5. Encapsulation Location and Structure](#)
 - [5.1. Encapsulation in the Hop-by-Hop Options Header](#)
 - [5.2. Encapsulation in the Destination Options Header](#)
 - [5.3. Encapsulation in the Segment Routing Header](#)
- [6. IANA Considerations](#)
- [7. Security Considerations](#)
- [8. Acknowledgements](#)
- [9. Normative References](#)
- [Authors' Addresses](#)

1. Introduction

SAN ID and SAN header is designed under the SAN framework [[I-D.huang-service-aware-network-framework](#)] as a interface between user and service as well as between service and network. Client requests the service through SAN header encapsulated in user data packet header by SAN routing and forwarding network. SAN network would index SAN ID based on the corresponding networking and computing policies and resources. This document provides several scalable solutions about SAN header encapsulation to support SAN architecture in IPv6 networks.

2. Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14 [[RFC2119](#)] [[RFC8174](#)] when, and only when, they appear in all capitals, as shown here.

3. Terminology

*SAN: Service Aware Network.

*SAN ID: Service Aware Network Identification, an identification designed to indicate the fundamental and common service types.

*SAN header: Encapsulation format of the SAN ID [[I-D.service-identification-header-of-san](#)].

4. The SAN Option

To support Service Awareness Network, it is necessary to define an IPv6 header option [[RFC8200](#)], that is the SAN Option.

The SAN option format is as the following format:

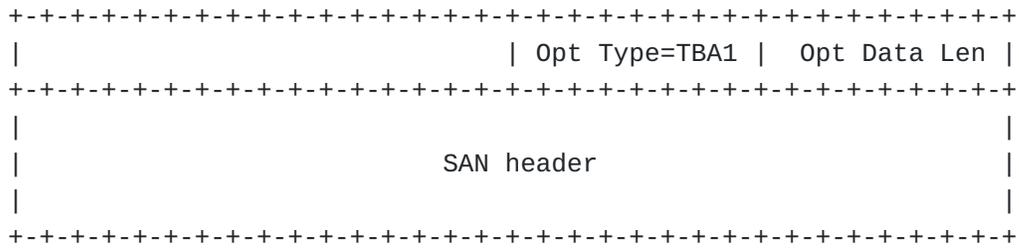


Figure 1: The SAN Option

Opt Type: 8-bit identifier of the type of option identifies this option as SAN Option. A new type value TBA1 for SAN option, recommended value 0x1D, the highest-order 3 bits should be set to zero-valued.

Opt Data Len: 8-bit unsigned integer. Length of the Option Data field of this option, that is, length of the SAN data.

SAN header: Option-Type-specific data. It carries the SAN identification. Data of this field specified in [[I-D.service-identification-header-of-san](#)].

5. Encapsulation Location and Structure

The SAN service identification can be encapsulated in several locations in the IPv6 packet extension header, such as Hop-by-Hop Options Header, Destination Options Header, and Segment Routing Header, depend upon the scenarios and implementation requirements.

5.1. Encapsulation in the Hop-by-Hop Options Header

SAN header can be carried as an option in the ipv6 hop-by-hop options header. The Option Type indicates that this option is a service identification SAN Option. The SAN header can be resolved by every SAN network nodes.

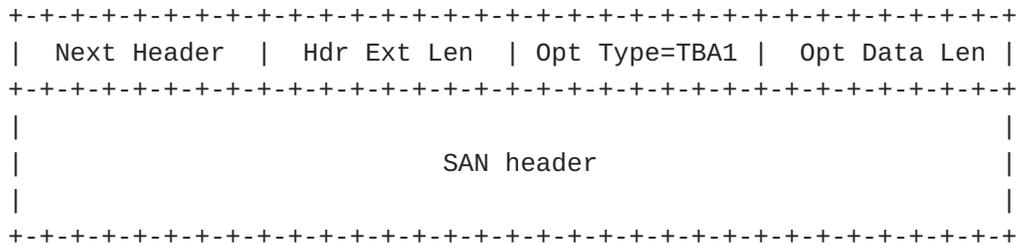


Figure 2: SAN header in Options header

5.2. Encapsulation in the Destination Options Header

SAN header can be carried as an option in the ipv6 destination options header. The Option Type indicates that this option is a service identification SAN Option. The SAN header can be resolved by the SAN network nodes.

The encapsulation format is the same as Figure 2

5.3. Encapsulation in the Segment Routing Header

The segment routing header (SRH) and the SRH TLV is defined in [\[RFC8754\]](#). The SAN header can be carried in SRH as one type of SRH TLV. When a SAN packet is sent to a SRv6 domain, according to the network service and computing service policy, the packet could be encapsulated or parsed SRv6 header, and the SAN header could be carried in the SRv6 header.

New SIDs defined in the future will indicate how the SAN type of SRH TLV works. The SAN header encapsulated in SRH TLV can be processed by the SAN nodes along the SRv6 path. The SAN TLV in SRH is as the following format:

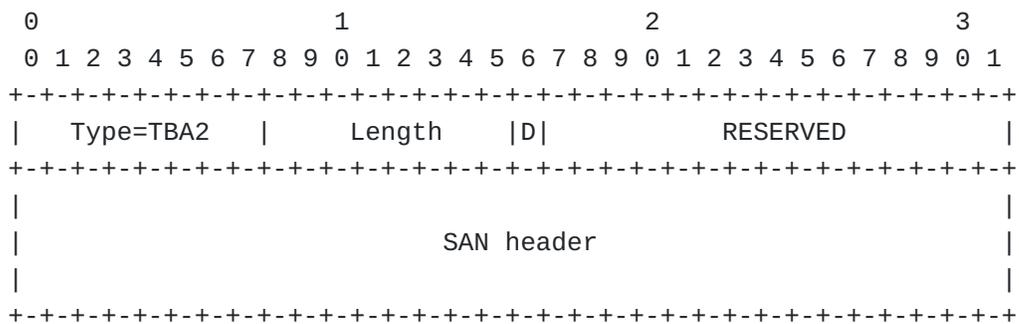


Figure 3: SAN type of SRH TLV

Type: A new type value TBA2 for SAN Type, suggested value 0x1D.

SAN header: Carries the SAN identification. Data of this field specified in [[I-D.service-identification-header-of-san](#)].

Other fields follow the definition in the [[RFC8754](#)].

6. IANA Considerations

IANA is requested to assign new values for the SAN Identification, one new IPv6 Header Option Type, one new SRH TLV Type, and one new Internet Protocol Numbers, as follows:

Value	Description	Reference
TBA1	SAN option type	[this document]
TBA2	SAN Type in SRH TLV	[this document]

Table 1

7. Security Considerations

TBA

8. Acknowledgements

TBA

9. Normative References

[[I-D.huang-service-aware-network-framework](#)] Huang, D. and B. Tan, "Service Aware Network Framework", Work in Progress, Internet-Draft, draft-huang-service-aware-network-framework-00, 24 May 2022, <<https://www.ietf.org/archive/id/draft-huang-service-aware-network-framework-00.txt>>.

[[I-D.service-identification-header-of-san](#)] Ma, L., Zhou, F., and H. Li, "Service Identification Header of Service Aware Network", Work in Progress, Internet-Draft, draft-service-identification-header-of-san-00, 18 August 2022, <<https://datatracker.ietf.org/api/v1/doc/document/draft-service-identification-header-of-san/>>.

[[RFC2119](#)] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, DOI 10.17487/RFC2119, March 1997, <<https://www.rfc-editor.org/info/rfc2119>>.

[[RFC8174](#)] Leiba, B., "Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words", BCP 14, RFC 8174, DOI 10.17487/RFC8174, May 2017, <<https://www.rfc-editor.org/info/rfc8174>>.

[RFC8200]

Deering, S. and R. Hinden, "Internet Protocol, Version 6 (IPv6) Specification", STD 86, RFC 8200, DOI 10.17487/RFC8200, July 2017, <<https://www.rfc-editor.org/info/rfc8200>>.

[RFC8754]

Filsfils, C., Ed., Dukes, D., Ed., Previdi, S., Leddy, J., Matsushima, S., and D. Voyer, "IPv6 Segment Routing Header (SRH)", RFC 8754, DOI 10.17487/RFC8754, March 2020, <<https://www.rfc-editor.org/info/rfc8754>>.

Authors' Addresses

Liwei Ma
ZTE Corporation
China

Email: ma.liwei1@zte.com.cn

Detao Zhao
ZTE Corporation
No.50 Software Avenue
Nanjing
Jiangsu, 210012
China

Email: zhao.detao@zte.com.cn

Fenlin Zhou
ZTE Corporation
No.50 Software Avenue
Nanjing
Jiangsu, 210012
China

Email: zhou.fenlin@zte.com.cn