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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

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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:

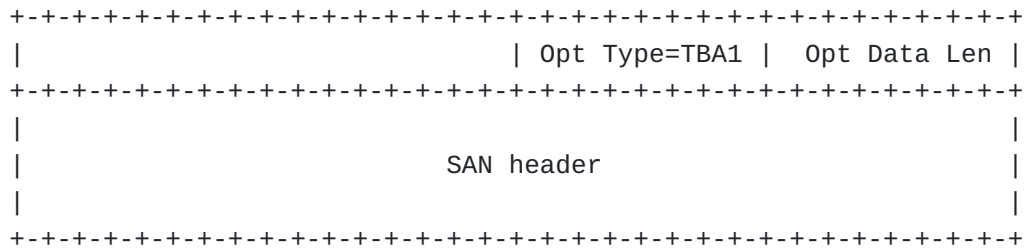


Figure 1: The SAN Option

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.

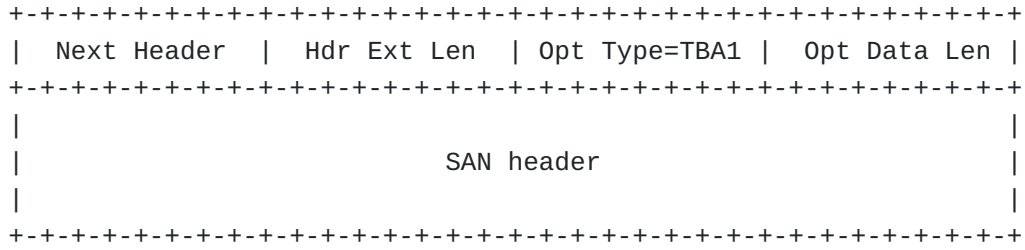


Figure 2: SAN header in Options header

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:

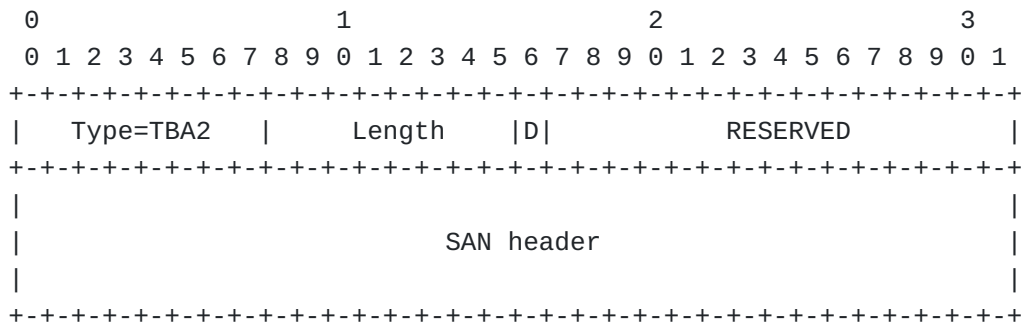


Figure 3: SAN type of SRH TLV

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

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[RFC8754]

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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