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Service Identification Header of Service Aware Network

Abstract

As the cloud and computing migrates to edges further away from the traditional centered cloud, the services residing at the distributed cloud start to be delivered in such a ubiquitous and dynamic way. That it is challenging to the ongoing routing and interconnecting scheme under which host address is the global networking identification. This draft proposes a service identification which is designed to be treated both as a service routable ID and an interface to the service requirements as well as service-associated cloud resources. A SAN header which including the service identification is illustrated and specified.

Status of This Memo

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

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This Internet-Draft will expire on 5 November 2023.

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1. Introduction

Unlike routing and forwarding scheme which is only involved bearer network, the service delivered from cloud needs delicate coordination among the terminal, bearer network and cloud. In order to improve the end-to-end capability of the network, service aware network framework is proposed [I-D.huang-service-aware-network-framework]. The Service Identification Label designed in the SAN reference framework, as an interface between clients and services, as well as between services and the networks and clouds, solves the challenges that existing identification systems cannot simply integrate services through the endpoints, network and the cloud, and can effectively promote the evolution of service requirements.

This proposal introduces an SAN header with a simple semantics service identification as an index in the network layer to enable the network to be highly effectively aware of the requirements of various cloud services. This service identification is designed to purporting to the fundamental and common services for which the service qualities should be guaranteed by both delicate networking and computing resources.

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.

4. Design principles and key elements of SAN ID

The SAN ID has global semantics through the terminal, network and cloud, and seamlessly connects and integrates the service, network and cloud system.

The SAN ID does not explicitly carry attributes related to location and ownership. When the service is scheduled based on the SAN ID, there is no need to care about the detailed location of service instances, resource providers.

The SAN ID is only applicable to fundamental and common service types. The service identification only covers modular service types which are particularly sensitive to both networking and computing resources. When a service has multiple service instances, there is only one SAN ID used to indicate the general service type.

The SAN ID is only applicable to service types that have higher than "best effort" and "general computing processing" for computing network resources, that is to provides unified services of network and computing at layer L3.

The SAN ID supports type-based aggregation to improve the efficiency of indexing or forwarding, reduce the scale of SAN ID routing table entries.

5. Structure of SAN header

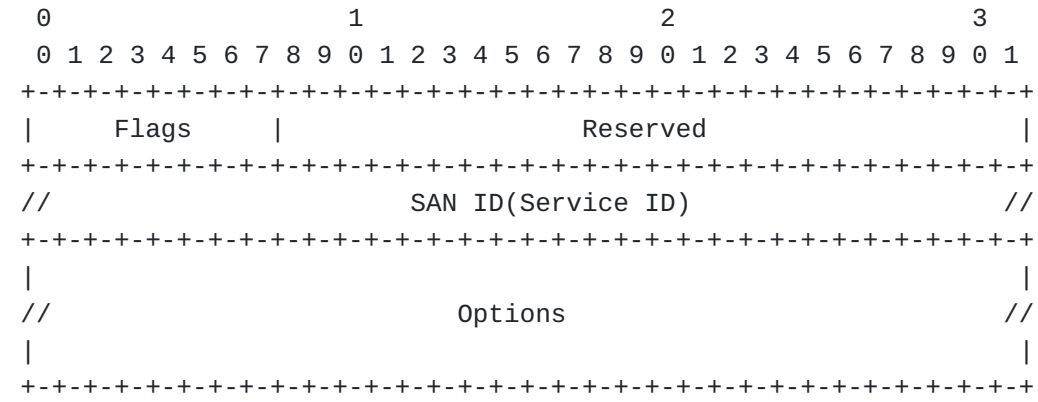

Figure 1: Structure of SAN header

Flags: 8 bits of flags. The first 4 valid bits are defined in this document. Other bits are unused and it SHOULD be ignored before future use. The details are as follows:

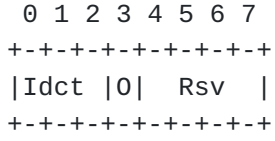

Figure 2

Idct: 3-bits SANID Indicator indicates the length of the SAN ID field. For example: If the Idct is defined as binary 000, the length of SAN ID field is 16 bytes. If the Idct is defined as binary 001, the length of SAN ID field is 32 bytes. If the Idct is defined as binary 010, the length of SAN ID field is 64 bytes.

O: 1 bit indicates that the Options field exists. If Options field exists, this O bit is set to 1, otherwise 0.

Rsv: 4-bits reserved field for future extension. The default value is 0.

Reserved: 3-bytes reserved field for future extension. The default value is 0.

SAN ID: fixed length field and the length of the SAN ID is determined according to the ind field. Service ID identifies a fundamental and common service ,the recommended SAN ID length is 16 bits, 32 bits, 64 bits or other lengths compatible with the common chip processing scheme. Service ID might consist of Hierarchical type identification (HID) and sub-service identification (Sub-SID). HID could represent the aggregation type of the service identification. Based on the HID, SAN can identify the category of

application/service requests initiated by the terminal, and recognize that service sessions belonging to the same category of application/service requests.Sub service identification(Sub-SID), combines with HID to represent a globally unique service semantic identification, and apply to fundamental and common generic service.

Options: an optional and extensible field that can be defined in multiple formats, such as TLVs.

Note: The Stream ID field has been removed from the previous version to take into account that the SAN is a service-oriented network, not an end-stream-oriented one. On the other hand, the life cycle of the Stream ID is different from that of the SAN ID. If necessary, it can be added to the Options field.

6. Security Considerations

TBA

7. Acknowledgements

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8. IANA Considerations

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9. Normative References

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