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Multi-Layer OAM for Service function Chaining
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Abstract

Since there are different notions of service chain, such as fully abstract notion named SFC, half-fully abstraction notion named SFP and fully specific notion named RSP, and there are different components defined in SFC architecture, it seems reasonable to define differentiated OAM for these different service chains. This document tries to discuss the multi-layer OAM requirements in SFC domain and provides a multi-layer OAM solution for different service chains.

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1. Introduction

Since there are different notions of service chain, such as fully abstract notion named SFC, half-fully abstraction notion named SFP and fully specific notion named RSP, and there are different components defined in SFC architecture, it seems reasonable to define differentiated OAM for these different service chains. This document tries to discuss the multi-layer OAM requirements in SFC domain and provides a multi-layer OAM solution for different service chains.

2. Convention and Terminology

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 [RFC2119].

The terms are all defined in [I-D.ietf-sfc-architecture].

3. Requirement

In fact, besides the link layer OAM, network layer OAM, SFC service layer OAM is requisite in SFC Domain, which may be typically illustrated in Figure 1.

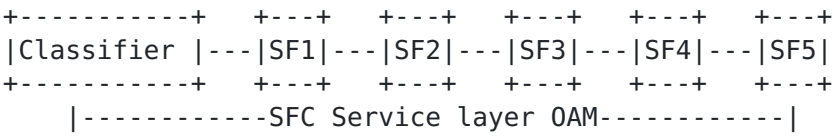

Figure 1: typical SFC service layer OAM

Currently, according to the latest SFC architecture, we know that there are several components defined in the SFC architecture, such as SN, SFF, SF,etc, and the relationship between them like this: serveral SFs may share the same SFF, and furthermore, serveral SFFs may share the same SN(e.g, different SFFs residented in one service node belong to different VPNs). As a result of that, multiple RSPs, such as RSP1(SF1--SF3--SF5) and RSP2(SF2--SF4--SF6) in Figure 2, may not share the same transmitting path, but they may share the same SFFs path.

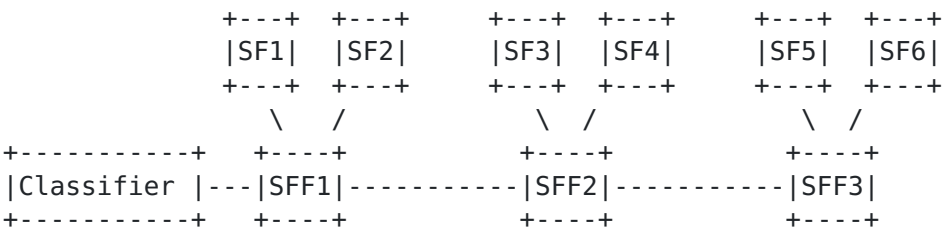

Figure 2: different RSPs share the same SFFs path

And also, multiple SFPs, such as SFP1(SFF1--SFF3--SFF5)(e.g, VPN1) and SFP2(SFF2--SFF4--SFF6)(e.g, VPN2) in Figure 3, may not share the same SFFs, but they may share the same SNs path.

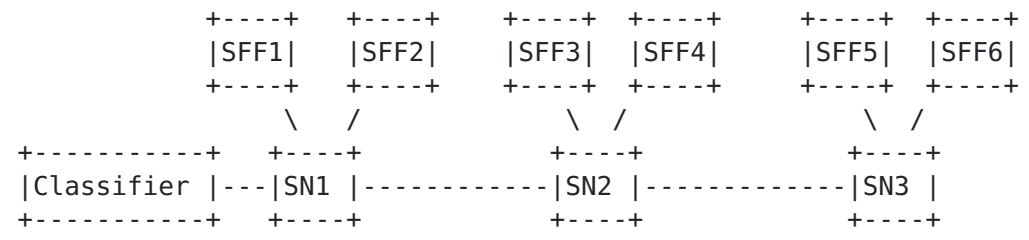

Figure 3: different SFPs share the same SNs path

As for users who want to diagnose, troubleshoot a set of RSPs which transmit the same SFFs, or a set of SFPs which transmit the same SNs, there is an aggregative method which can aggregate a set of RSPs or a set of SFPs into one, then, users only need to diagnose, troubleshoot the aggregative one, rather than the separated one by one. And also, if users are willing to diagnose and troubleshoot one by one, once the connectivity between different SFs is not OK, users can detect the connectivity between different SFFs where the SFs resident instead to narrow the failure coverage. In other words, if the connectivity between the detected SFFs is not OK, then the connectivity problem is located. if the connectivity betwwen the detected SFFs is OK, then the connectivity problem should be between the detected SFs and the detected SFFs, which can help to improve the efficiency of target location remarkably. Obviously, they can be diagnosed, troubleshooted one by one or aggregatively according to preferance.

As follow, this document tries to provide an architecture and a solution for differentiated layer OAM for this requirement.

4. Multi-layer SFC OAM architecture

Figure 4 is a possible architecture for multi-layer SFC OAM. In this figure, it tries to figure out three possible layers. The layer 1 is the most aggregative layer for service chain. It stretches the path which SNs go through according to the sets of RSPs or SFPs or SFCs. The layer 2 is the medium aggregative layer for service chain. It outlines the path which SFFs go though according to the sets of RSPs or SFPs or SFCs. The layer 3 is the specific path for service chain. It is exactly the path which SFs go though according to the sets of RSPs or SFPs or SFCs.

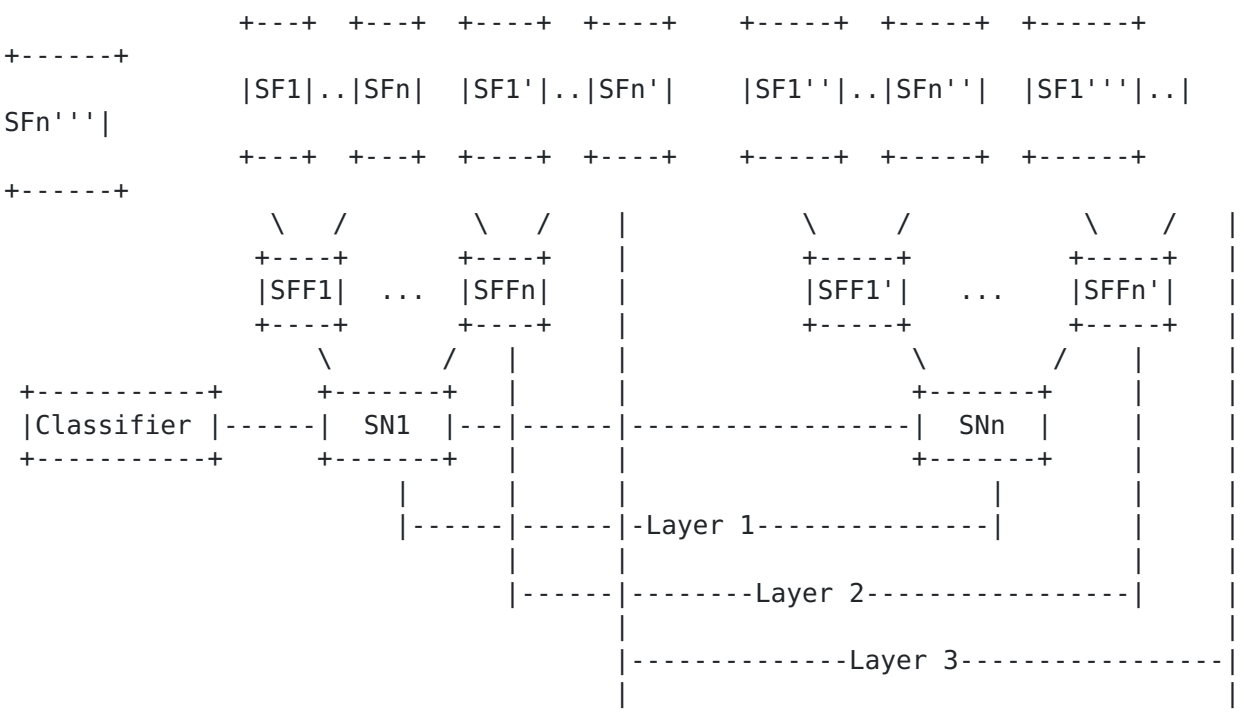

Figure 4: a possible architecture for multi-layer SFC OAM

5. Solution

If anyone is interested in this requirement, I will update the solution in the next version.

6. Security Considerations

It will be considered in a future revision.

7. IANA Considerations

It will be considered in a future revision.

8. References

8.1. Normative References

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

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