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Network Service Header TLVs
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Abstract

This draft describes Network Service Header (NSH) MD-Type 2 metadata TLVs that can be used within a service function path.

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 April 21, 2018.

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1. Introduction

Network Service Header [NSH] is the SFC encapsulation protocol used to create Service Function Chains. As such, NSH provides two key elements:

1. Service Function Path identification

2. Metadata

NSH further defines two metadata formats (MD Types): 1 and 2. MD Type 1 defines fixed length, 16 byte metadata, whereas MD Type 2 defines a variable-length TLV format for metadata. This draft defines some common TLVs for use with NSH MD Type 2.

This draft does not address metadata usage, updating/chaining of metadata or other SFP functions. Those topics are described in NSH.

2. NSH Type 2 Format

A NSH is composed of a 4-byte Base Header, a 4-byte Service Path Header and Context Headers. The Base Header identifies the MD-Type in use:

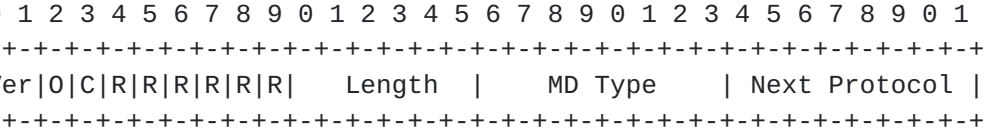


Figure 1: NSH Base Header

Please refer to NSH [NSH] for a detailed header description.

When the base header specifies MD Type= 0x2, zero or more Variable Length Context Headers MAY be added, immediately following the Service Path Header. Therefore, Length = 0x2, indicates that only the Base Header followed by the Service Path Header are present. The number, indicated in the length field, of optional Variable Length Context Headers MUST be of an integer indicating length in 4-bytes words Figure 3 below depicts the format the context header.

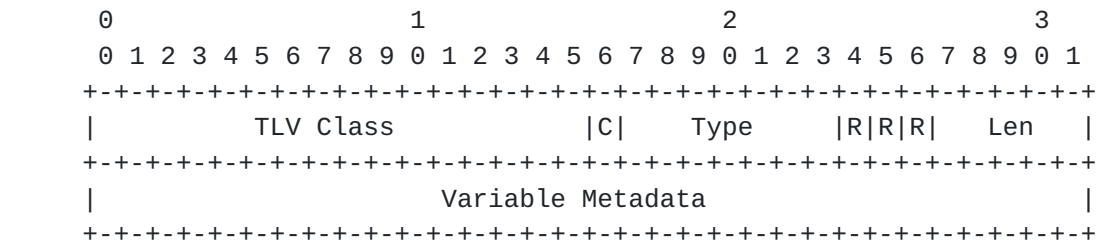


Figure 2: NSH TLV Format

3. NSH Type 2 TLVs

As per NSH, TLV Class 0-7 are reserved for standards use. In this draft we use TLV Class 0 for the following Types:

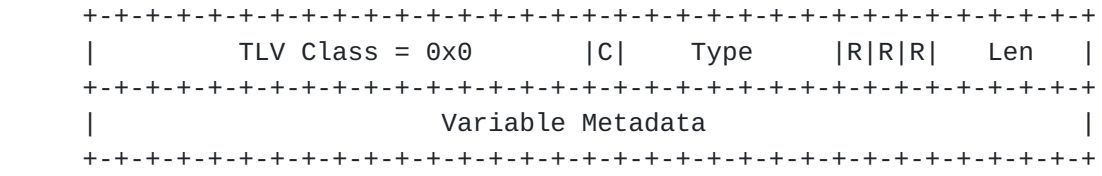
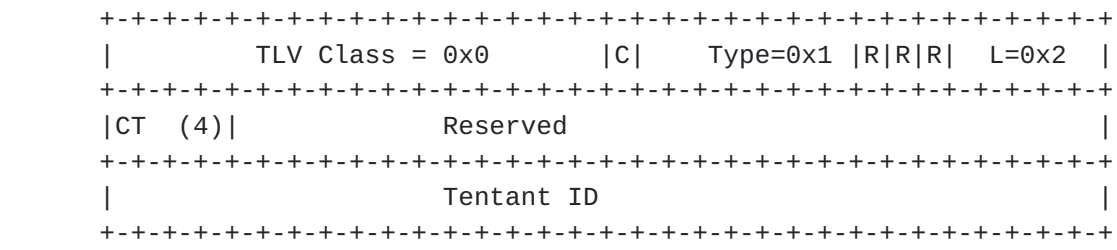


Figure 3: NSH TLV Class=0x0

1. Forwarding Context

   This TLV carries network-centric forwarding context, used for segregation and forwarding scope. Forwarding context can take several forms depending on the network environment. Commonly used data includes VXLAN/VXLAN- GPE VNID, VRF identification or VLAN.

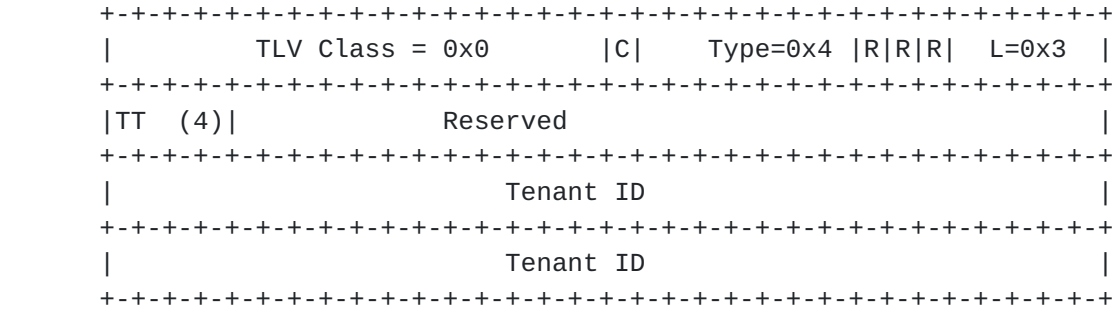


Context Type (CT), 4 bits:
0x0: 24 bit VXLAN/LISP virtual network identifier (VNI)
0x1: 32 bit MPLS VPN label
0x2: VLAN

Figure 4: Forwarding Context

2. Tenant

Tenant identification is often used for segregation within a multi-tenant environment. Orchestration system generated tenant IDs are an example of such data.



Tenant Type (TT), 4 bits:
0x0: 32 bit
0x1: 64 bit

Figure 5: Tenant Identifier

3. Content Type

Provides explicit information about the content being carried, for example, type of video or content value for billing purposes

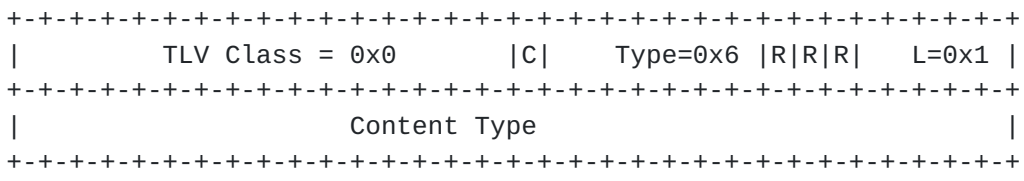


Figure 6: Content Type

4. Ingress Network Information

This data identifies ingress network node, and, if required, ingress interface.

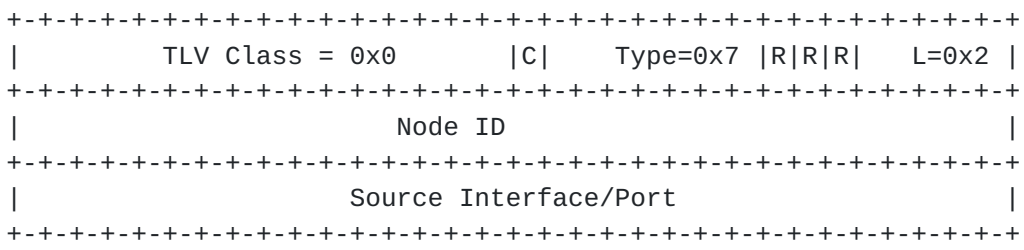


Figure 7: Ingress Network Info

5. Flow ID

Flow ID provides a representation of flow. Akin, but not identical to the usage described in [RFC6437]

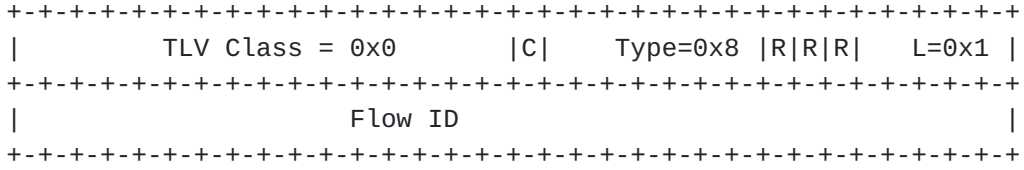
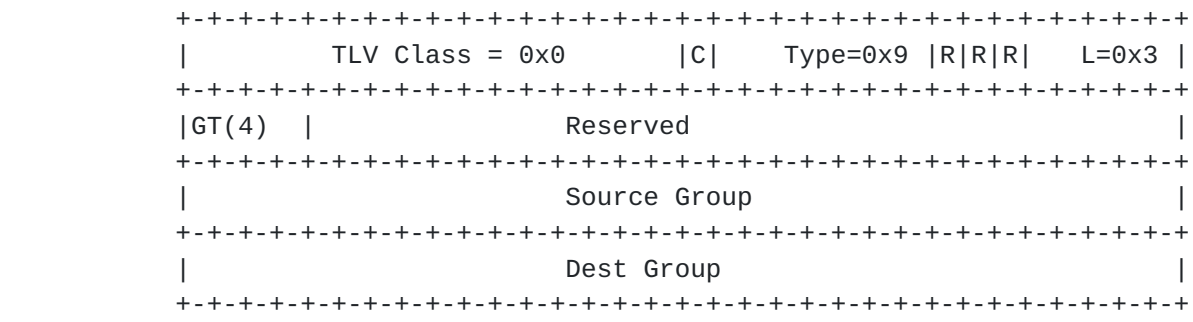


Figure 8: Flow ID

6. Source and/or Destination Groups

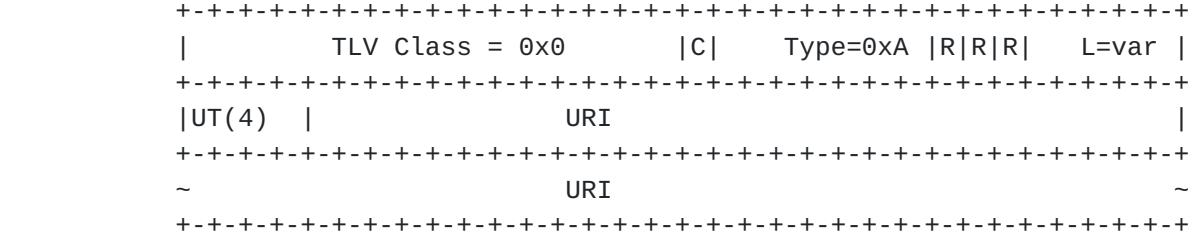
Intent-based systems can use this data to express the logical grouping of source and/or destination objects. [GROUPBASEDPOLICY] and [GROUPPOLICY] provide examples of such a system.



Group type (4):
0x1: Group Based Policy (GBP) end point group (EPG)

Figure 9: End Point Group

7. Universal Resource Identifier (URI)



URI type (4):
0x1: URI in standard string format as defined in RFC 3986
0x2: URI represented in a compacted hash format

Figure 10: URI

8. Policy Identifier (POLICY_ID)

Policy is often referred by a system generated identifier which is then used by the devices to lookup the content of the policy locally. For example this identifier could be an index to an array, a lookup key, a database Id. The identifier allows enforcement agents or services to lookup up the content of their part of the policy quite efficiently.

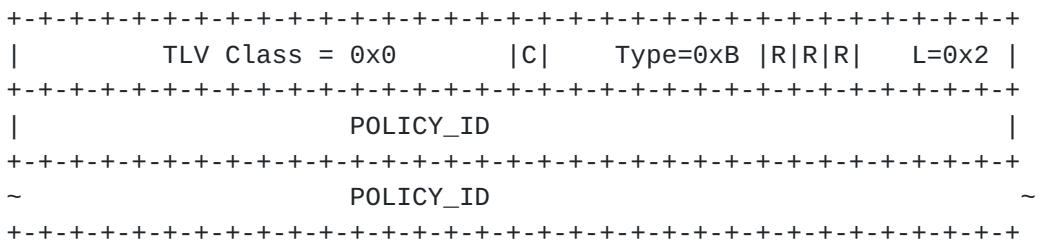


Figure 11: POLICY_ID

4. Security Considerations

NSH describes the requisite security considerations for protecting NSH metadata.

5. Acknowledgments

The authors would like to thank Behcet Sarikaya, Dirk von Hugo and Mohamed Boucadair for their work regarding usage of subscriber and host information TLVs.

6. IANA Considerations

IANA is requested to create a new "Network Service Header (NSH) TLV Type" registry. TLV types 0-127 are specified in this document. New values are assigned via Standards Action [RFC5226].

7. References

7.1. Normative References

[NSH] Quinn, P., Ed. and U. Elzur, Ed., "Network Service Header", 2016, <https://datatracker.ietf.org/doc/draft-ietf-sfc-nsh/>.

7.2. Informative References

[GROUPBASEDPOLICY]
OpenStack, "Group Based Policy", 2014, <https://wiki.openstack.org/wiki/GroupBasedPolicy>.

[GROUPPOLICY]
OpenDaylight, "Group Policy", 2014, <https://wiki.opendaylight.org/view/Group_Policy:Main>.

[RFC5226] Narten, T. and H. Alvestrand, "Guidelines for Writing an IANA Considerations Section in RFCs", RFC 5226, DOI 10.17487/RFC5226, May 2008, <https://www.rfc-editor.org/info/rfc5226>.

[RFC6437] Amante, S., Carpenter, B., Jiang, S., and J. Rajahalme, "IPv6 Flow Label Specification", RFC 6437, DOI 10.17487/RFC6437, November 2011, <https://www.rfc-editor.org/info/rfc6437>.

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