Network Working Group
Internet-Draft
Intended status: Standards Track
Expires: April 13, 2016

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October 11, 2015

Network Service Header TLVs
draft-quinn-nsh-tlv-00.txt

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 13, 2016.

Table of Contents

1. Introduction

Network Service Header NSH [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:

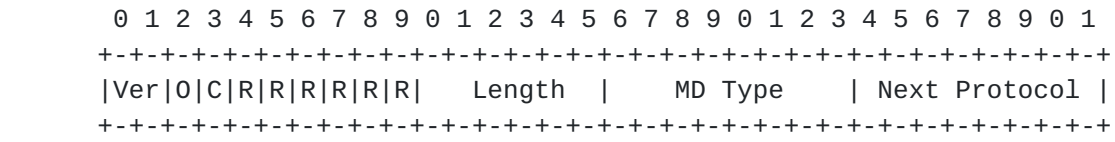


Figure 1: NSH Base Header

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.

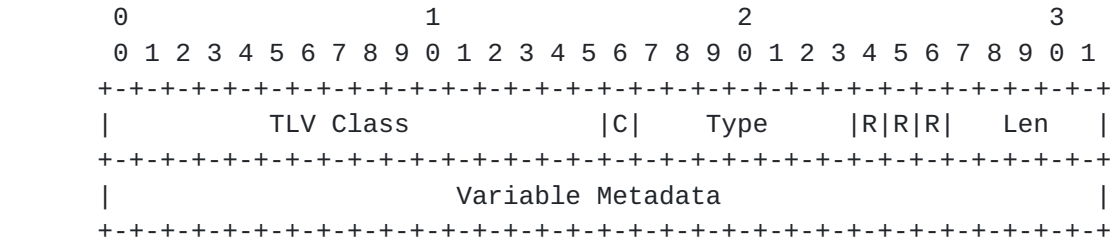


Figure 2: NSH TLV Format

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:

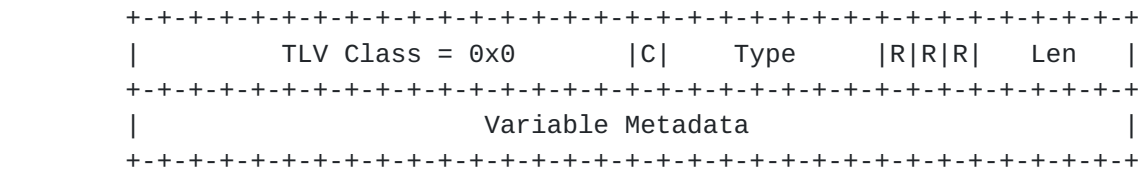
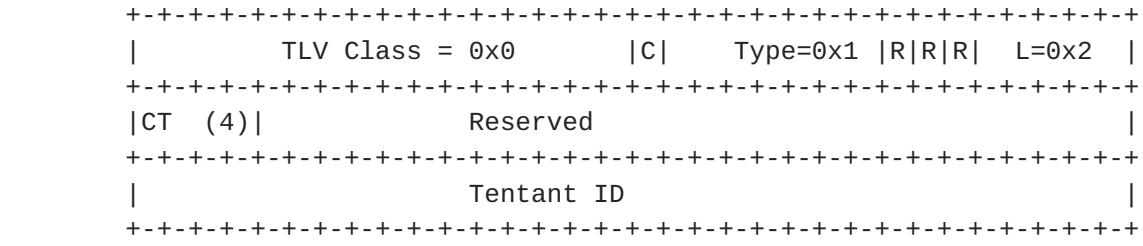


Figure 3: NSH TLV Class=0x0

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, MPLS VPN label values or VLAN.

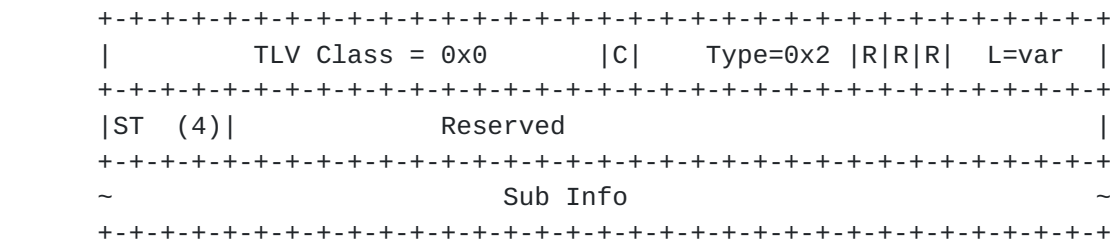


Context Type (CT), 4 bits:
0x0: 24 bit VXLAN/LISP virtual network identifier (VNI)
0x1: 32 bit MPLS VPN label
0x2: VLAN

Figure 4: Forwarding Context

2. Subscriber/user Information

Subscriber information varies in both format and source depending on network environment. A commonly used example is PCRF information in mobile deployments.

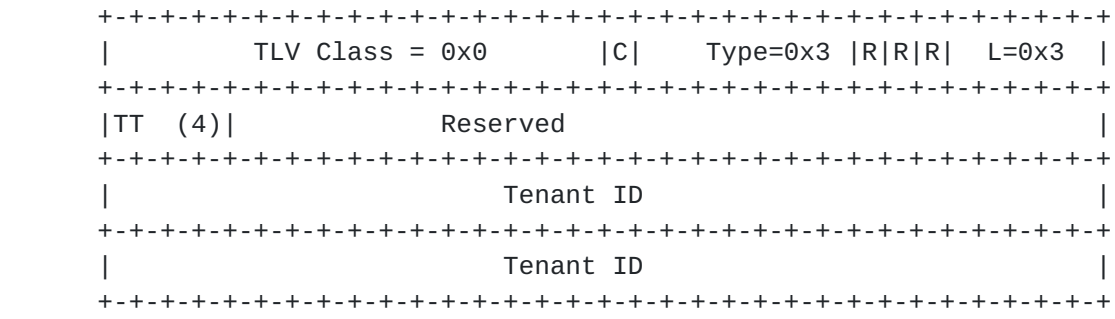


Subscriber Type (ST), 4 bits:
0x0: Hex
0x1: String

Figure 5: Subscriber/user Information

3. 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 6: Tenant Identifier

4. Application ID

Application identification may be used for SF policy enforcement. [NSH AppID] provides guidelines and examples of such data.

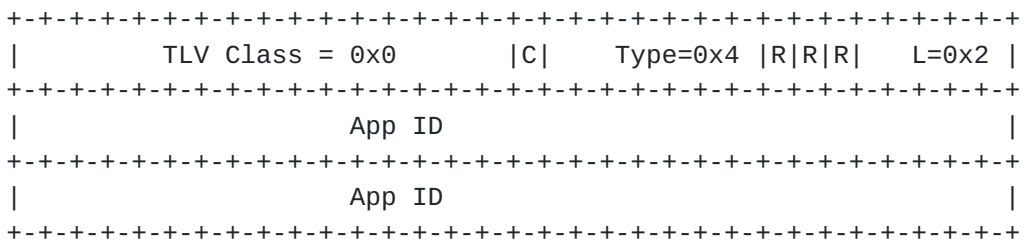


Figure 7: Application ID

5. Content Type

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

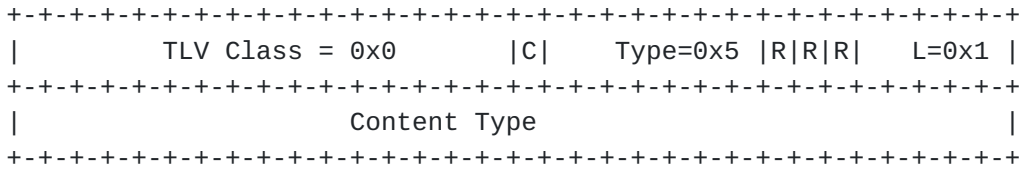


Figure 8: Content Type

6. Ingress Network Information

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

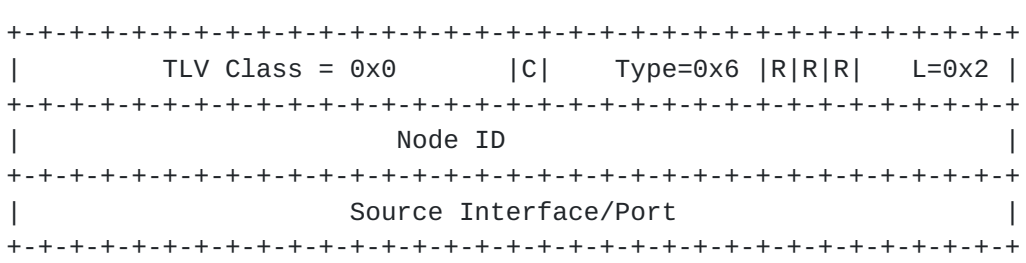


Figure 9: Ingress Network Info

7. Flow ID

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

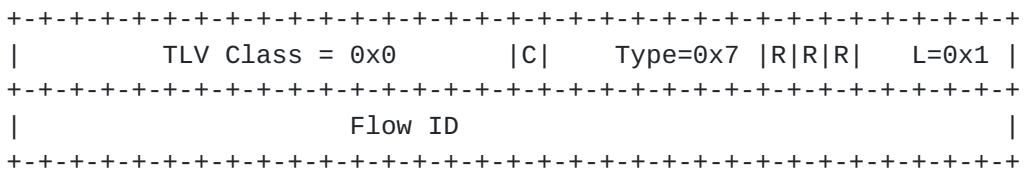
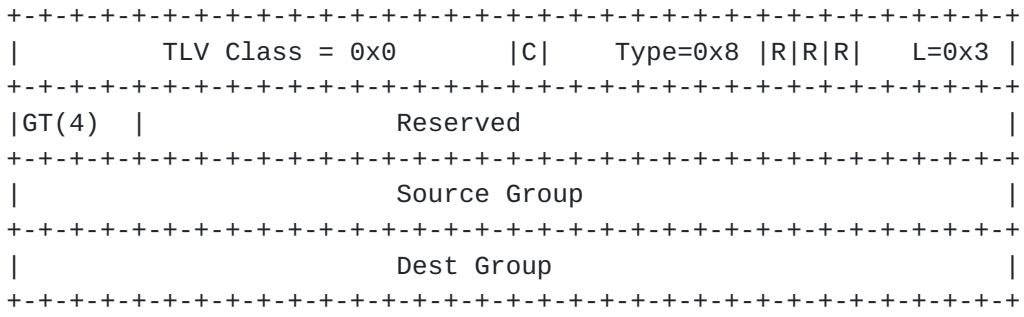


Figure 10: Flow ID

8. Source and/or Destination Groups

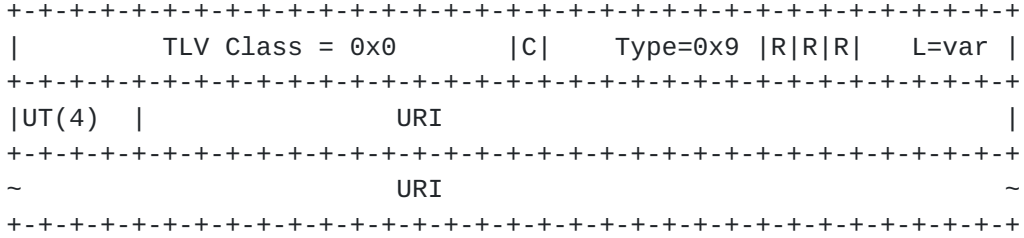
Intent-based systems can use this data to express the logical grouping of source and/or destination objects. [GROUPBASEDPOLICY] and [GROUPPOLICY] provide examples of such a system.



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

Figure 11: End Point Group

9. 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 12: URI

4. Security Considerations

NSH describes the requisite security considerations for protecting NSH metadata.

5. 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].

6. References

6.1. Normative References

6.2. Informative References

[GROUPBASEDPOLICY]
OpenStack, "Group Based Policy", 2014.

[GROUPPOLICY]
OpenDaylight, "Group Policy", 2014.

[NSH] Quinn, P., Ed. and U. Elzur, Ed., "Network Service Header", 2015.

[NSH AppID]
Penno, R., Claise, B., and C. Fontaine, "Using Application Identification in Services Function Chaining Metadata", 2015.

[RFC5226] Narten, T. and H. Alvestrand, "Guidelines for Writing an IANA Considerations Section in RFCs", BCP 26, RFC 5226, DOI 10.17487/RFC5226, May 2008, <http://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, <http://www.rfc-editor.org/info/rfc6437>.

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