



# Inband Network Telemetry Extensions

Ramesh Sivakolundu  
Cisco Systems Inc.



C97-738306-01 © 2017 Cisco and/or its affiliates. All rights reserved.

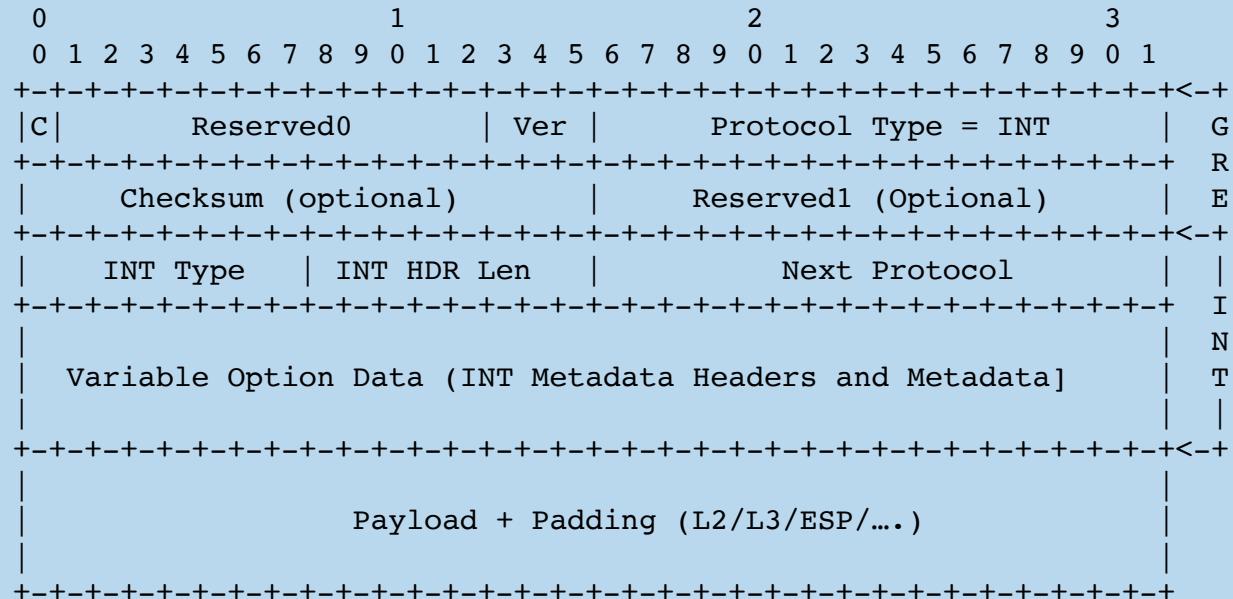
# INT – IPv4 GRE

# INT in IPv4 (GRE)

- GRE encapsulation is defined in [RFC2784].
- The GRE Protocol Type value is TBD\_INT.
- The INT Header is defined as follows:
  - **INT Type:** 8-bit field defining the INT Header type, as defined in
    - INT Hop-By-Hop Type
    - INT Destination Type
  - **INT Hdr Len:** 8-bit Length field contains the length of the variable INT data octets in 4-octet units.
  - **Next Protocol:** 16 bits Next Protocol Type field contains the protocol type of the packet following IOAM protocol header. When the most significant octet is 0x00, the Protocol Type is taken to be an IP Protocol Number as defined in [IP\_PROT]. Otherwise, the Protocol Type is defined to be an EtherType value from [ETYPES]. An implementation receiving a packet containing a Protocol Type which is not listed in one of those registries SHOULD discard the packet.

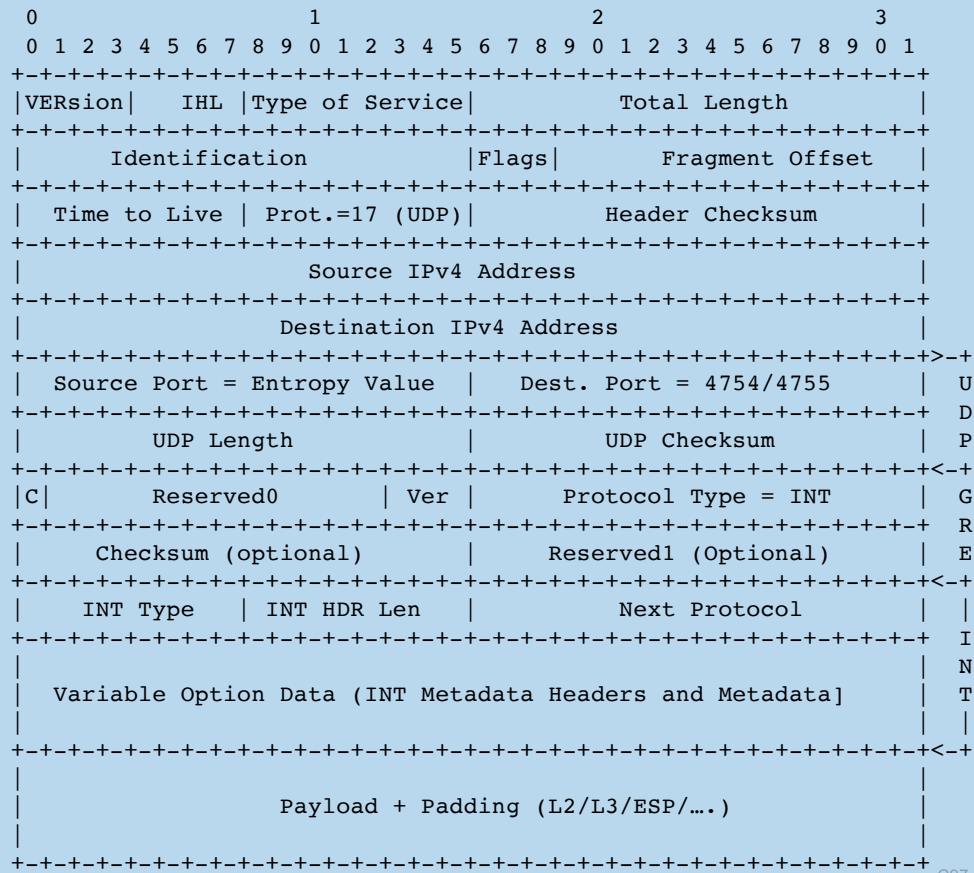
# INT in IPv4 (GRE) - contd

**INT Metadata following GRE Header:**



# INT in IPv4 (GRE-in-UDP) - contd

INT Metadata following GRE H-in-UDP Header:



# INT – IPv6 Extension Header

# INT in IPv6

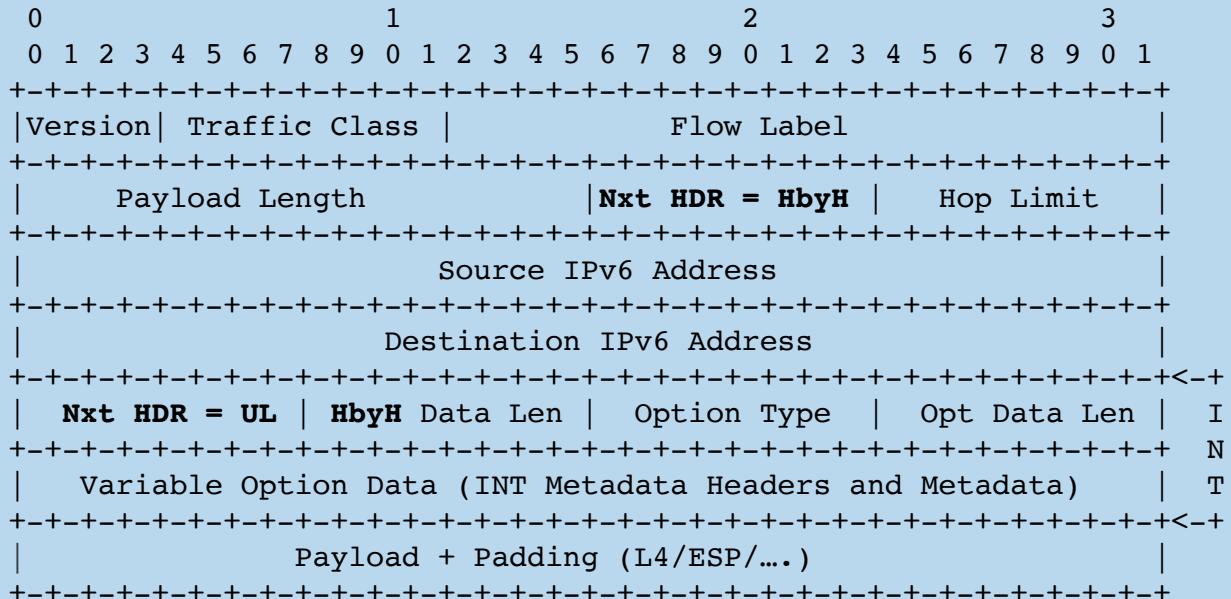
### **IPv6 HbyH header Option:**

- **HbyH Ext Len:** 8-bit unsigned integer.  
Length of the Hop-by-Hop Options header  
in 8-octet units, not including the  
first 8 octets.
  - **Option Type:** 8-bit identifier of the  
type of option.
    - ❑ 001xxxxx 8-bit identifier of the type of  
option.  
xxxxxx=TBD\_IANA\_INT\_HOP\_BY\_HOP\_OPTION\_IPV6.
    - ❑ 001xxxxx 8-bit identifier of the type of  
option.  
xxxxxx=TBD\_IANA\_INT\_DESTINATION\_OPTION\_IPV6
      - .
  - **Opt Data Len:** 8-bit unsigned integer.  
Length of the Reserved and Option Data  
field of this option, in octets.
  - **Reserved (MBZ):** 16-bit field MUST be  
filled with zeroes.



# INT in IPv6

## IPv6 HbyH header Option:



- Option Type: 8-bit identifier of the type of option.
  - 001xxxxx 8-bit identifier of the type of option.  
xxxxxx=TBD\_IANA\_INT\_HOP\_BY\_HOP\_OPTION\_IPV6.
  - 001xxxxx 8-bit identifier of the type of option.  
xxxxxx=TBD\_IANA\_INT\_DESTINATION\_OPTION\_IPV6 .
- Opt Data Len: 8-bit unsigned integer. Length of the Reserved and Option Data field of this option, in octets.

# INT – SRv6 Extension Header

## INT in SRv6

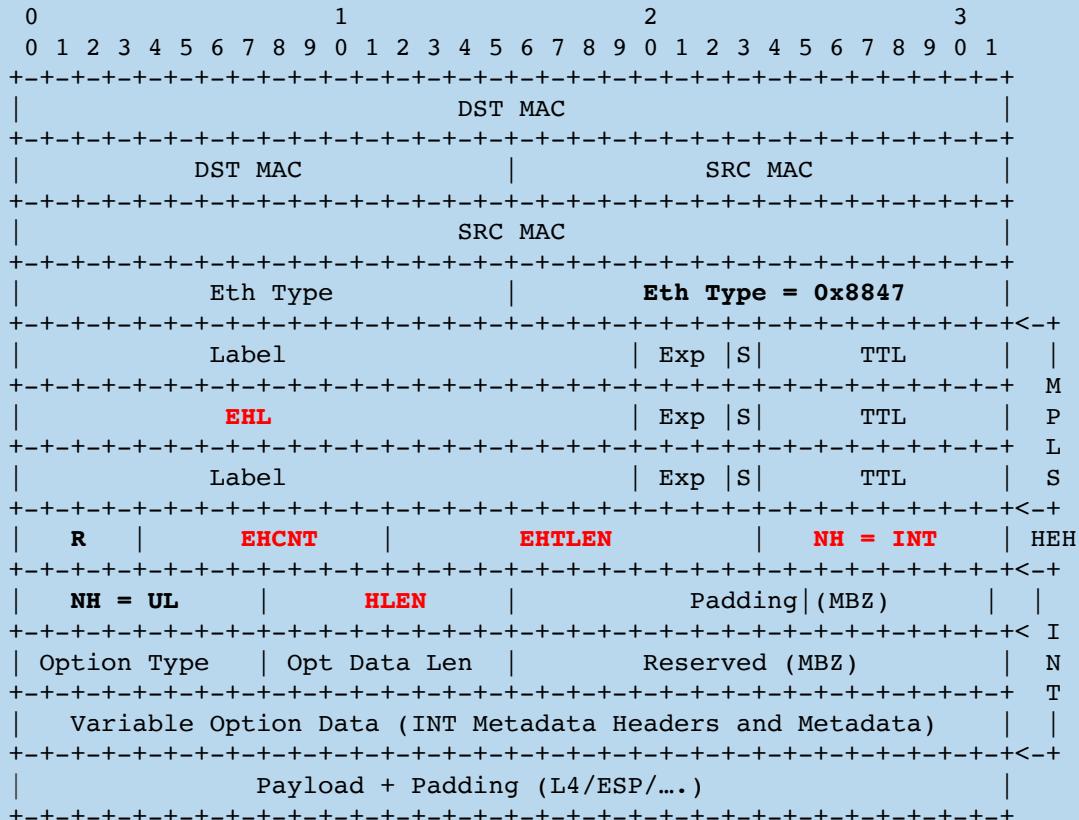
#### **IPv6 HbyH header Option:**

- **HbyH Len:** 8-bit unsigned integer.  
Length of the Hop-by-Hop Options header  
in 8-octet units, not including the  
first 8 octets.
  - **Option Type:** 8-bit identifier of the  
type of option.
    - 001xxxxxx 8-bit identifier of the type of  
option.  
xxxxxx=TBD\_IANA\_INT\_HOP\_BY\_HOP\_OPTION\_IPV6.
    - 001xxxxxx 8-bit identifier of the type of  
option.  
xxxxxx=TBD\_IANA\_INT\_DESTINATION\_OPTION\_IPV6
    - .
  - **Opt Data Len:** 8-bit unsigned integer.  
Length of the Reserved and Option Data  
field of this option, in octets.
  - **Reserved (MBZ):** 16-bit field MUST be  
filled with zeroes.

# INT – MPLS Extension Header

# INT in MPLS

## MPLS Extension Header Option:



- **EHL:** Extension Header Label (EHL). IANA Assigned label value. The format of EHL is the same as MPLS label.
- **EHCNT:** 8-bit unsigned integer. Extension Header Counter. This field keeps the total number of extension headers included in this packet. It does not count the original upper layer protocol headers.
- **EHTLEN:** 12-bit unsigned integer. Extension Header Total Length in 4-octet units. This field keeps the total length of the extension headers in the packet, not including the HEH itself.
- **NH:** 8-bit selector for the Next Header. This field identifies the type of header immediately following the HEH.
- **HLEN:** 8-bit unsigned integer. Extension header length in 4-octet units, not including the first four octets.
- **R:** 4-bit field MUST be filled with zeroes.

