

Protocol Encapsulations for IOAM data

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Protocol encapsulation of IOAM: Baseline approach

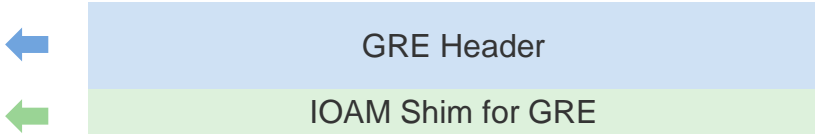
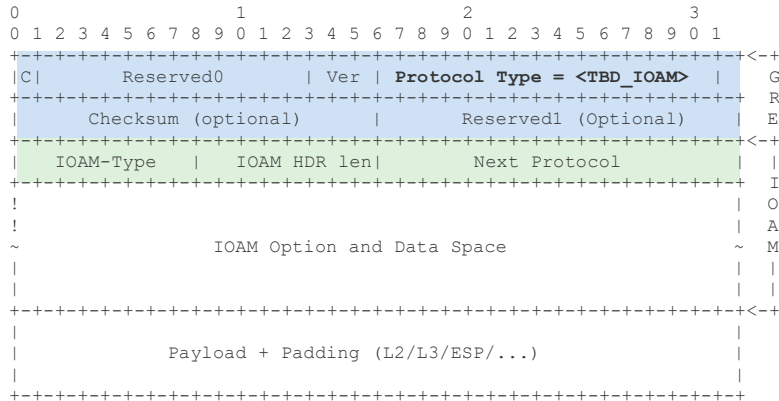
- An encapsulation of IOAM data fields should be friendly to an implementation in both hardware as well as software forwarders and support a wide range of deployment cases, including large networks that desire to leverage multiple IOAM data fields at the same time.
 - Avoid nested lookup structures if feasible
- Use only a single “next protocol” code point for IOAM
 - Required for some protocols
 - Enabled by [draft-ietf-ippm-ioam-data-02](#): IOAM-Type defines the IOAM Option type (incremental-trace, preallocated-trace, E2E, POT)
 - Allows for consistent encapsulation approach across many protocols
- IOAM is not expected to alter the forwarding behavior of the packet
 - Avoid semantic dependencies between IOAM and protocol used for encapsulation

In-situ OAM (IOAM) in GRE

[draft-weis-ippm-ioam-gre-00](#)

IOAM data encapsulated in GRE

([draft-weis-ippm-ioam-gre-00](#))



IOAM Type: 8-bit field defining the IOAM Option type, as defined in Section 7.2 of [I-D.ietf-ippm-ioam-data].

IOAM HDR Len: 8 bits Length field contains the length of the variable IOAM data octets in 4-octet units.

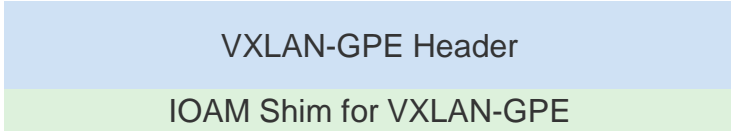
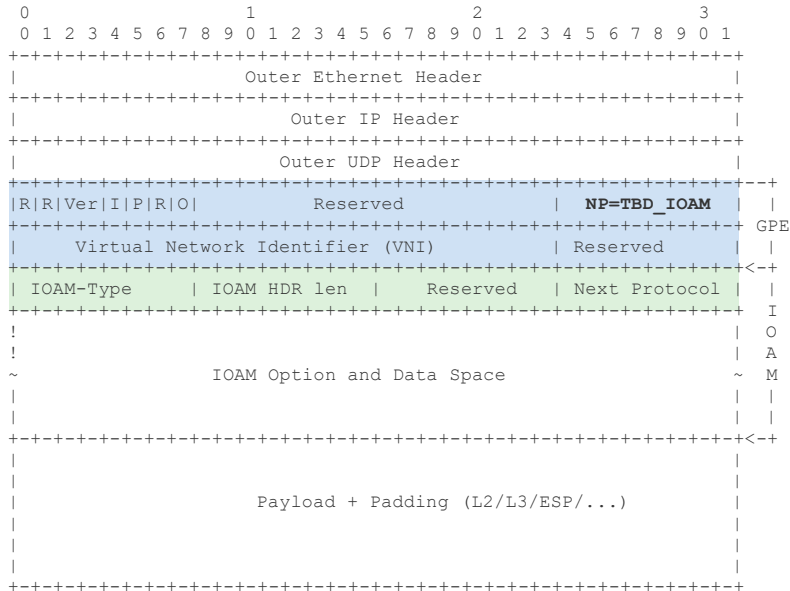
Next Protocol: 16 bits Next Protocol Type field contains the protocol type of the packet following IOAM protocol header. When the most significant octet is 0x00, the Protocol Type is taken to be an IP Protocol Number as defined in [IP-PROT]. Otherwise, the Protocol Type is defined to be an EtherType 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.

In-situ OAM (IOAM) in VXLAN-GPE

[draft-brockners-ippm-ioam-vxlan-gpe-00](#)

IOAM data encapsulated in VXLAN-GPE

([draft-brockners-sfc-ioam-nsh-01](#))



IOAM-Type: 8-bit field defining the IOAM Option type, as defined in Section 7.2 of [I-D.ietf-ippm-ioam-data].

IOAM HDR len: 8-bit unsigned integer. Length of the IOAM HDR in 4-octet units.

Reserved: 8-bit reserved field **MUST** be set to zero upon transmission and ignored upon receipt.

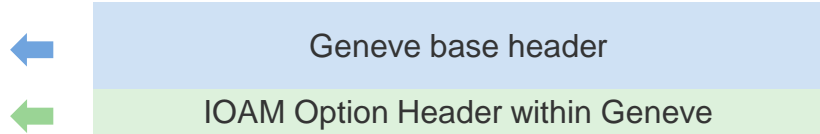
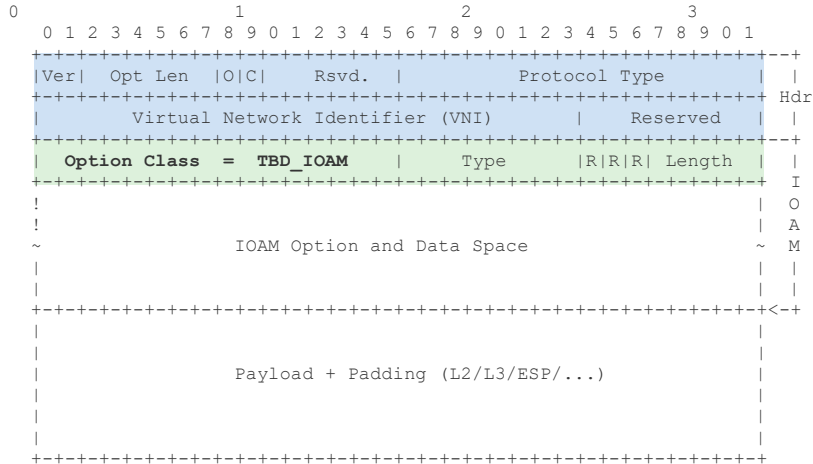
Next Protocol: 8-bit unsigned integer that determines the type of header following IOAM protocol. The value is from the IANA registry setup for VXLAN GPE Next Protocol defined in [I-D.ietf-nvo3-vxlan-gpe].

In-situ OAM (IOAM) in Geneve

[draft-brockners-ippm-ioam-geneve-00](#)

IOAM data encapsulated in Geneve

([draft-brockners-ippm-ioam-geneve-00](#))



Option Class: 16-bit unsigned integer that determines the IOAM option class. The value is from the IANA registry setup for Geneve option classes as defined in [I-D.ietf-nvo3-geneve].

Type: 8-bit field defining the IOAM Option type, as defined in Section 7.2 of [I-D.ietf-ippm-ioam-data].

R (3 bits): Option control flags reserved for future use. MUST be zero on transmission and ignored on receipt.

Length: 5-bit unsigned integer. Length of the IOAM HDR in 4-octet units.

Next Steps

- Request to adopt the encapsulation drafts as working group documents in IPPM:
 - [draft-weis-ippm-ioam-gre-00](#)
 - [draft-brockners-ippm-ioam-geneve-00](#)
 - [draft-brockners-ippm-ioam-vxlan-gpe-00](#)