Generic UDP Encapsulation for NVO3

draft-herbert-gue-03
draft-hy-nvo3-gue-4-nvo-01

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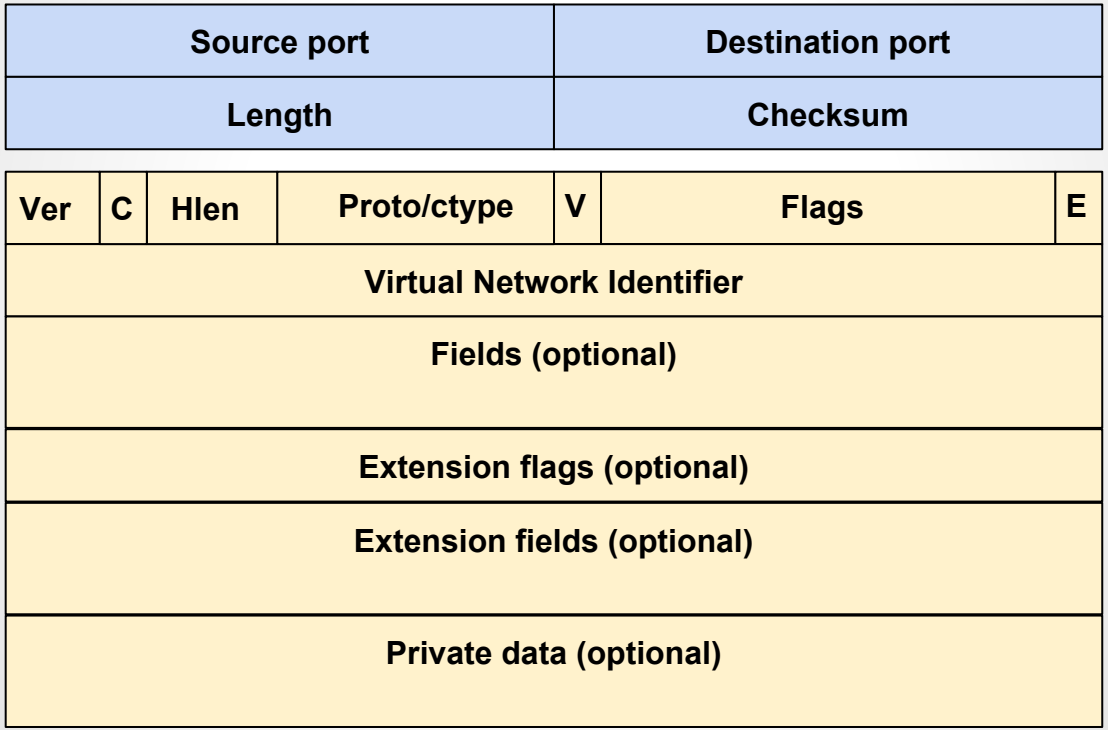
Overview

- Basics
  - UDP encapsulation with four byte encap header
  - Control (OAM) and Data (IP protocol) messages
  - Flag-fields like GRE
  - VNID for network virtualization
- Changes in latest draft
  - Rework private options
  - Private data immediately follows last field
  - Private flags renamed to extension flags

GUE headers for NVO3



Salient features/differentiators

- Foundation
- Network virtualization
- Extensibility
- Security

Foundation

- GUE roots lie in GRE
  - GRE is established, well deployed, and **simple**
  - We hit a wall trying extending GRE
- GUE is generic encapsulation protocol that supports network virtualization
  - Same model of extensibility and simplicity as GRE
  - Header length allows middle box deep parsing
  - Meets isolation and security requirements of NVO3

Network Virtualization

- Virtual network identifier
  - V bit must be set for network virtualization
  - 32 bit VNID field (can be extended)
- Other options fields may be used
  - Security field guarantees virtual network isolation
  - Private data may be used by NVO3 implementations
- Protocols encapsulated
  - Layer 2: Ethernet
  - Layer 3: IPv4, IPv6, experimental IP protocols

Extensibility

- Flag bits
  - 16 bits in primary header
  - 32 bit in extension header
  - 6 bits currently defined
- Fields and private data
  - Up to 128 bytes of optional field
  - Some fields can be repurposed
  - Private data region after last field

Protocol extensions

Defined

- Virtual network identifier
- Security field
- Header checksum
- Remote checksum offload

Possibly

- OAM
- Outer/inner TTL mapping
- Congestion control
- Fragmentation
- Group based policy
- Remote segmentation offload

Probably not

- CRC
- Reliability layer
- QoS
- QCN
- Pseudo wire related
- Routing related
- Inband negotiation

GUE security

- Security field
  - Protects VNID, GUE header
  - Anticipate different levels (different field sizes)
  - Simple L2TP-like security cookie defined
- IPsec interaction
  - Header stack: IP|UDP|GUE|ESP|{IP|Ether}
  - All bits created by client are covered
  - GUE header still in outside header for VNID filtering

Request

We would like to ask for WG adoption of Generic UDP Encapsulation as a data plane solution for NVO3.

Thank you!