GUE & ILA update

draft-ietf-intarea-gue-00
draft-herbert-gue-extensions-01
draft-herbert-nvo3-ila-01

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Generic UDP Encapsulation (GUE)

- draft-ietf-intarea-gue-00
  - Basic encapsulation format and operations
  - Now WG item
  - In-depth review by Bob Briscoe since last IETF

- draft-herbert-gue-extensions-01
  - Fundamental extensions
  - Added a bit to security field and defined HMAC for header similar to that in SR security
GUE extensions

**Defined***
- Security field
- Header checksum
- Remote checksum offload
- Fragmentation
- Payload transform
- VNID**

**Possibly**
- Passive OAM
- Outer/inner TTL mapping
- Congestion control
- Group based policy
- Segmentation offload
- Session identifier
- LISP header

**Probably not**
- CRC
- Reliability layer
- QoS
- QCN
- Pseudo wire related
- Routing related
- Inband negotiation

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* Defined in draft-herbert-gue-extensions.01
** Defined in draft-hy-nvo3-gue-4-nvo-04
GUE extensibility clarification

● Model
  ○ Flag fields like GRE
  ○ **Does not** use TLVs or header chains for extensibility

● Rationale
  ○ History of TLVs in <= L3 protocols not good (e.g. IPv4 options, IPv6 EHs)
  ○ TLV complexity, wire overhead, HW processing
  ○ Need a few tens of options not hundreds. Estimating two per year (~ rate of TCP options)
Next steps

- Request draft-herbert-gue-extensions-01 to be WG draft
- Request WF feedback on draft-ietf-intarea-gue-00
Identifier Locator Addressing

- draft-herbert-nvo3-ila-03 (data plane)
- Defining control plane and mobility (5G) use case in other drafts
- In process of deploying in Facebook data center as data center virtualization solution
Mapping function

● Map identifier to locator
  ○ Like mapping vaddr to paddr in nvo3

● ILA hosts
  ○ Map identifier to locator, like mapping vaddr to paddr
  ○ Maintain cache, populate by resolution protocol or redirect (latter only if we can secure)

● ILA routers
  ○ Can translate and forward packets in network
  ○ Synchronize mapping database
Control plane work

- Mapping database will eventually contain billions of entries. How to scale?
- IDEAS effort to describe a generalized mapping system
- Combine elements of LISP, routing, and others (probably in routing area)
Caveats for ILA

● ICMP
  ○ Hosts can get ICMP errors for packets with ILA destinations
  ○ If host is ILA-aware attempt reverse translation there
  ○ If ILA router is in return path of ICMP error, reverse there as in NAT (RFC5508)

● Multicast
  ○ Can’t modify destination, modifying source address would be problematic at non-ILA receiver
  ○ Conclusion: ILA not appropriate with multicast
Relationship between GUE and ILA

- Both are a means of network virtualization, overlay networks, Loc/ID separation
- GUE allow extensibility, particularly important for security (e.g. for multi-tenant nvo3)
- ILA no extensibility, but no overhead also (good for single tenant DC virtualization)
Next steps

- Request draft-herbert-nvo3-ila-03 to be WG draft
- Work on control plane
  - ILA specific
  - General mapping protocol
Thank you!