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**

* 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, particular 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!