BGP Remote-Next-hop Draft
BGP Tunnel Encapsulation Draft

BGP Remote-Next-hop Draft

- New generic encapsulation attribute
  - Signaled with NLRIs in any address family
  - Attribute carries one or more tunnel endpoints and tunnel parameters
- Helps build dynamic overlay infrastructure
- First presented at IETF, Atlanta 2012
  - WG call requested in July 2014
  - Received a good support for adoption
  - Questions/concerns raised by Eric Rosen and Bruno Decraene

BGP Remote Nexthop Draft

- We have worked through all the concerns

- As a result we now have a new draft: draft-rosen-idr-tunnel-encaps-00

- Moving forward draft-rosen-idr-tunnel-encaps-00 will replace draft-vandevelde-idr-remote-nexthop

Tunnel Encapsulation Draft

- ## Updates RFC5512 to remove some restrictions

  - ### Uses Tunnel Encapsulation Attribute defined in RFC5512

  - ### Tunnel Endpoint MAY not be NLRI of Tunnel SAFI

  - ### Tunnel Endpoint no longer required to be same IP address as next hop of the update to which it is attached

  - ### Attribute can now be attached to updates of many different SAFIs, not merely *Encapsulation-SAFI*

What is the Tunnel Encapsulation Attribute?

- ## Sequence of TLVs, one per tunnel
  - ### TLV type identifies type of tunnel (e.g., VXLAN,GRE)
  - ### Sub-TLVs describe how to form encapsulation header when sending packet through the tunnel
    - New *Tunnel Endpoint* sub-TLV defined to allow each tunnels' endpoint address to be explicitly given; endpoint need not be same as next hop of update
  - ### Per new draft, can be attached to most AFI/SAFIs
  - ### To forward a packet matching a given route, select one of the tunnels to send it through
    - Choice of tunnel depends on policy

Differences between the *Tunnel Encaps* Draft and the *Remote Next Hop* Draft?

- Technical content of RNH draft largely retained

- Improved integration with RFC5512 mechanisms (less overlap between different mechanisms)

- More detail on the way to use *Encapsulation sub-TLVs* to describe how to form tunnel encapsulation headers

  - Almost enough to permit multi-vendor interop; still more detail needed in some cases

- New sub-TLVs for setting fields of outer IP/UDP headers

More Differences

- New material regarding use of Tunnel Encaps attribute on updates of labeled address families
  - Various options exist for integrating MPLS-based apps with non-MPLS transport tunnels
  - New sub-TLVs are provided allowing one to specify the exact option to be used
- More detail on error handling:
  - When TLVs and/or sub-TLVs are malformed
  - When a TLV is not malformed, but the remote endpoint of the corresponding tunnel is unreachable

More Differences (Cont'd)

- Clarifies that Tunnel Encaps attribute has no effect on BGP bestpath selection
- Addresses issues that can arise when tunnel endpoint is different than update's next hop:
  - Points out some counter-intuitive results that can occur
  - Presents some applicability restrictions, e.g.:
    - No support for "option B" style of VPN interconnect
  - More "don't shoot yourself in the foot" warnings
- Increased emphasis on need for proper scoping of attribute distribution

Next Steps

- Remote-next-hop draft was submitted for WG acceptance

- Some objections were raised

- Tunnel Encaps draft deals with these objections, and is result of collaboration between original authors and some of those who raised objections

- Would like to propose for WG acceptance