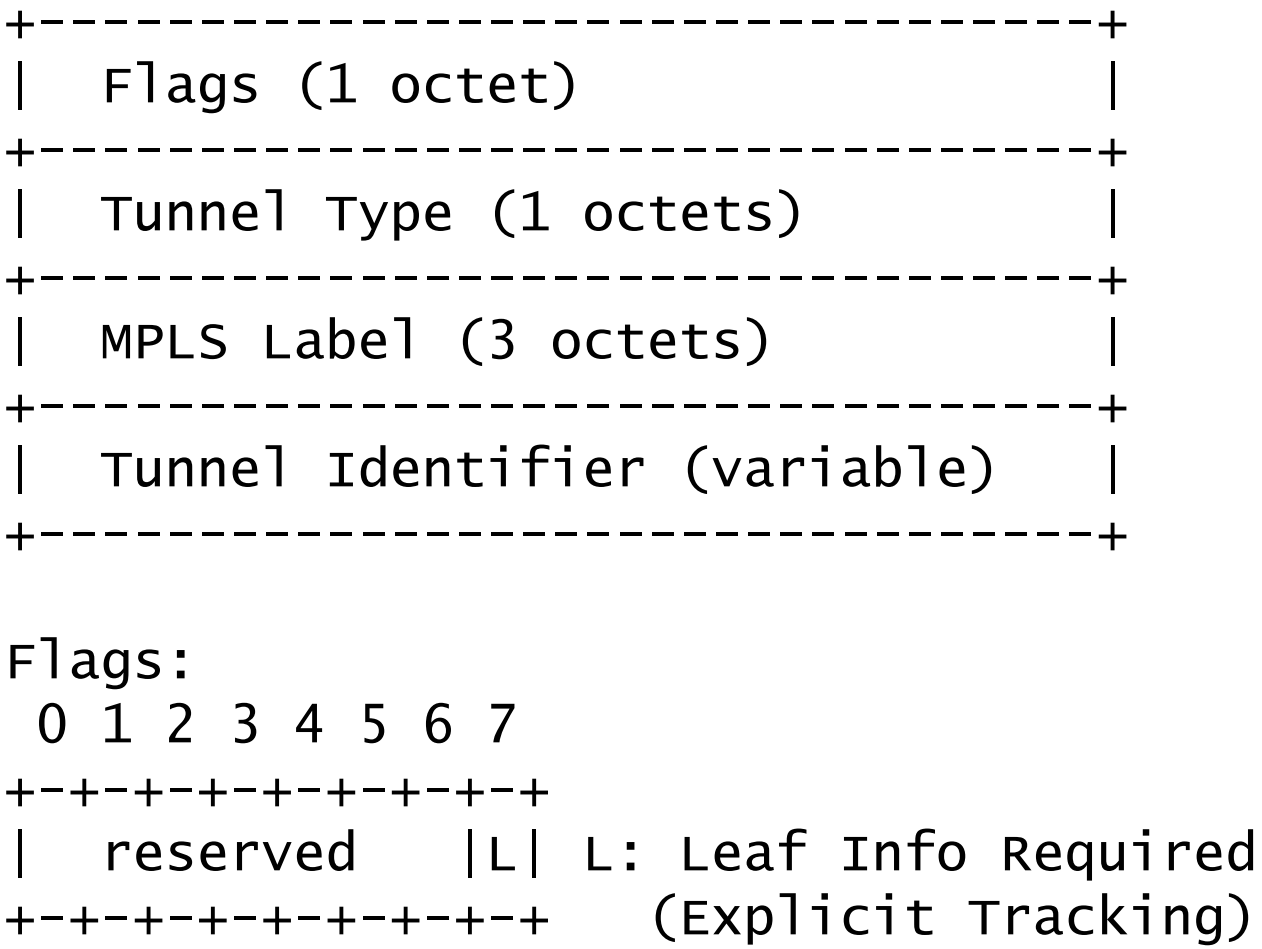
PMSI Tunnel Attribute Flags: IANA Considerations

- RFC6514 defines *PMSI Tunnel Attribute (PTA)*
- Carried in I/S-PMSI and Leaf A-D routes
- Contains *Flags* octet
  - Defines one bit (**L**, explicit tracking), others *reserved*
  - Another (**LIR-pF**) needed for optimized explicit tracking
- Our problem today:
  - **No IANA Registry** for allocating flags to specific uses
  - Drafts and deployments are grabbing bits to use for new purposes (5 of the 7 available bits are claimed)
  - No registry ⇒ inevitable c**odepoint clash** in the field

PTA Fields



Use of MPLS Label and Tunnel Identifier depends on A-D route type and tunnel type

L defined to be applicable independent of tunnel type, but dependent on route type

Why Isn't It Trivial to Avoid Future Codepoint Clashes?

- Seems simple enough:
  - Ask IANA to create *PTA Flags* registry
  - Preserve all existing uses
  - Add new **LIR-pF** flag
  - Maybe a bit or 2 still left over for the future
- We can do this as long as we don't mind using up so many bits right away
- Otherwise, we have some decisions to make

One *PTA Flags* Registry or Many?

- **L** defined for all tunnel types, but only certain route types
  - New **LIR-pF** flag similar in function to **L** flag
  - Most other new flags being used are per-tunnel-type (EVPN IR/AR)
    - Or is that per-SAFI per tunnel-type?
    - Or per-AFI/SAFI per tunnel-type?
    - Or per route-type per tunnel-type?
    - Or …
- Do we want one registry or many? How many?
- This leads to various proposals …

Registry Proposal 1

- One Registry for *PTA Flags*
  - Avoid use for flags specific to tunnel types
  - Include the explicit tracking flags (**L** and **LIR-pF**)
  - Move the EVPN/IR/AR flags somewhere else
    - Other attribute, or
    - Extended Community, or
    - Encode in Tunnel Identifier field, or …
- Advantage: simple, easy for IANA to manage
- Disadvantage: users of the EVPN/IR/AR bits must modify implementation and deployments

Registry Proposal 2

- All flags are type-specific (for some notion of “type”)
  - Set up a registry per type
  - Include the EVPN/IR/AR flags in registry of appropriate type
- Advantage:
  - EVPN/IR/AR implementations/deployments unaffected
- Disadvantages:
  - Must define appropriate set of types
  - For every new type, authors must remember to set up registry and figure out which flags apply; will probably lead to a lot of mistakes, omissions, and wrong guesses
  - What if we need a new flag for multiple tunnel types, but run out of bits for some of the types?

Registry Proposal 3

- Split the difference, e.g.:
  - “Universal” registry with, e.g., bits 1,2,7
  - Per-type registries with bits 0, 3, 4, 5, 6
- Advantage: no hard decisions to make now
- Disadvantages:
  - Extremely hard for IANA to manage:
    - new registries will be set up for all new tunnel types,
    - hard to ensure they don’t set up the wrong bits
  - We still really run out of bits now; eventually we’ll be creating new route or tunnel types just to get more flags

What Should We Do?

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