

PIM Join Attributes for LISP

draft-arango-pim-join-attributes-for-lisp-00

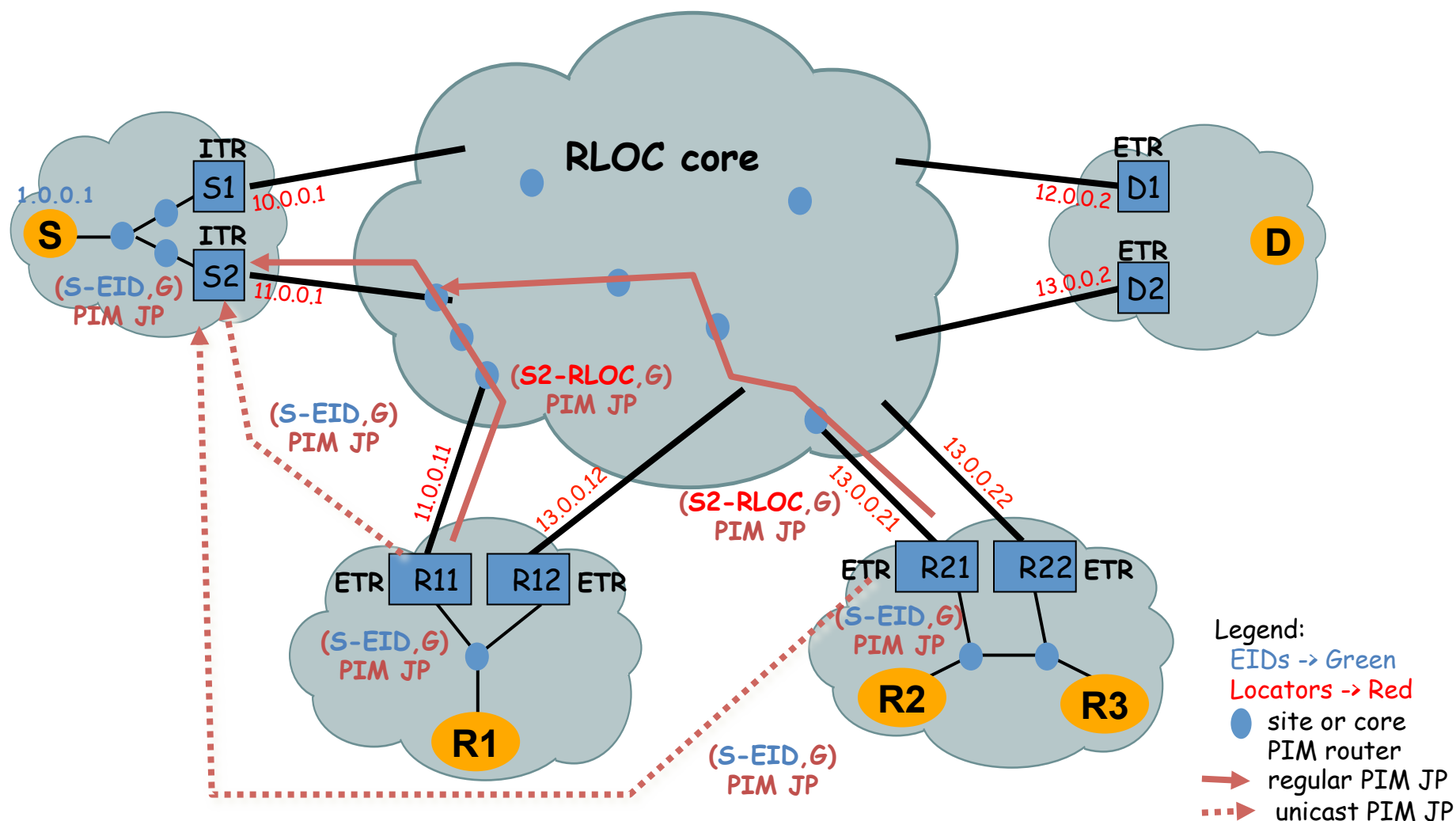
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Problem Being Solved

- LISP multicast (RFC6831) defaults to multicast transport over the RLOC core
- However, implementations are initially focusing on unicast transport with head-end replication at the root site
- Support LISP multicast over core networks that do have native multicast support
- Support mixed environments where some receivers have core multicast connectivity and some do not

RFC-6831 PIM Signaling

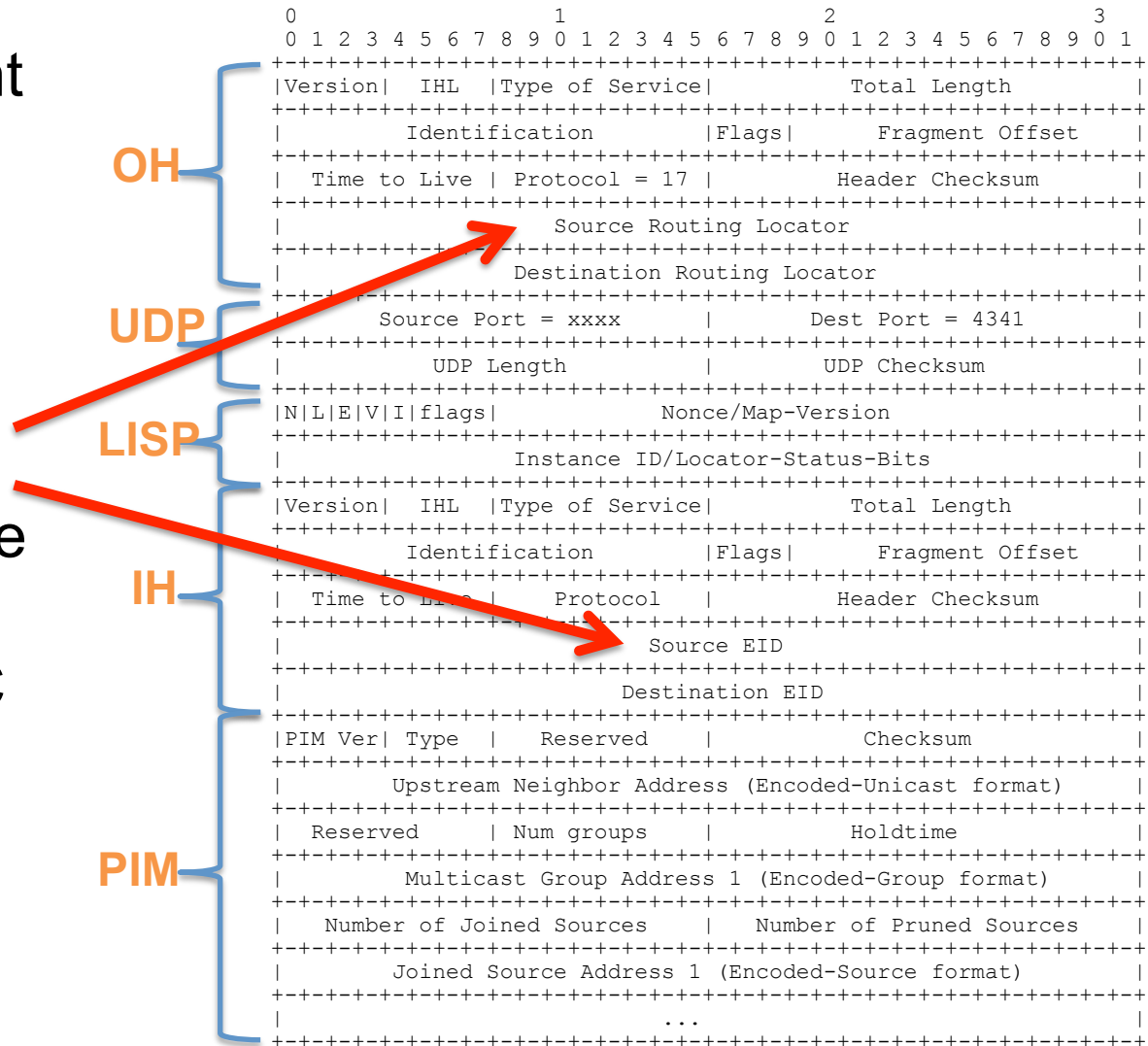


Unicast Transport

- Unicast Transport with head-end replication at the root-ITR **only uses Unicast LISP encapsulated (S-EID,G)** J/P from receiver-ETR to root-ITR (no native PIM J/P over RLOC core)
- Unicast transport requires the communication of two additional pieces of information in the PIM (S-EID,G) Join message:
 - An indication that the **receiver-ETR wants unicast transport** and is not additionally joining through native multicast by sending an (S-RLOC,G) Join
 - The **receiver-ETR RLOC address** that should be used as the destination for the LISP unicast encapsulated multicast data packets

Encoding Receiver-ETR RLOC

- No options in current LISP encapsulated PIM J/P message format
- **Outer and inner IP header source addresses cannot be used to carry receiver-ETR RLOC**



Outer IP Source Unsuitable

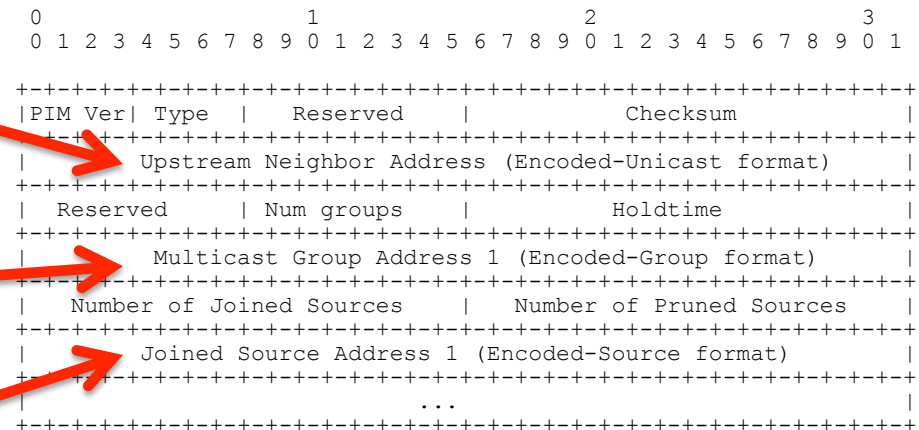
- Outer (LISP encapsulation) IP header source address is determined by routing
- The receiver-ETR interface that the join message is sent out of is **determined by the routing information for the root-ITR RLOC**
- The outer header IP source address:
 - Must be the **address of the interface that the encapsulated message is being transmitted on** to avoid URPF issues
 - Must be of the same AF as the selected root-ITR RLOC

Inner IP Source Unsuitable

- Inner (PIM message) IP header source address must be of EID address family and cannot be used to carry an RLOC AF address
- RFC-4601 mandates that PIM J/P message IP header is of the same AF as the encoded group and source addresses that it carries
- The header must be of EID AF to ensure correct processing when received within the EID VRF of the root-ITR post LISP decapsulation

PIM J/P Attribute Solution

- PIM Join/Prune attributes can be used to carry additional information in a PIM J/P message (RFC 5384 + draft-venaas-pim-hierarchicaljoinattr)
- Attributes can be encoded on:
 - The Upstream Neighbor Address
 - A Multicast Group Address
 - A Joined or Pruned Source Address



Encoding LISP Unicast Transport Information as PIM J/P Attributes

- We are defining two new PIM Join / Prune attributes:
 - The **Transport Attribute** conveys the receiver-ETR choice of unicast transport over multicast
 - The **Receiver RLOC Attribute** conveys the receiver-ETR RLOC that should be used as the target for the LISP encapsulated multicast data

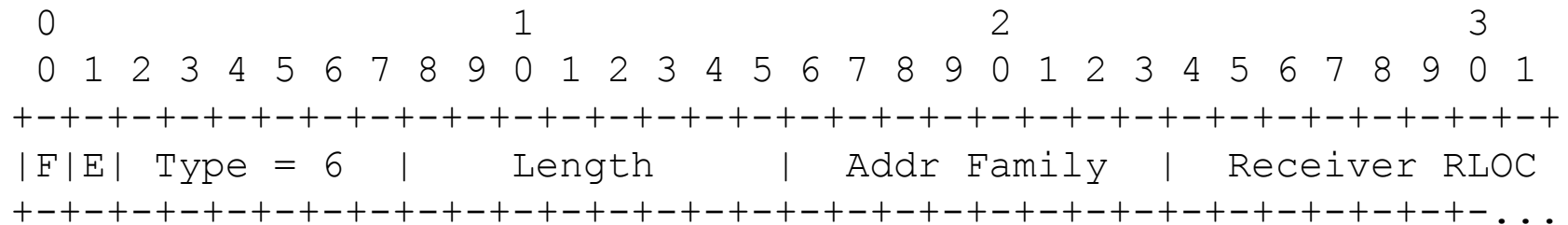
Transport Attribute Format

```

      0                               1                               2
    0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3
+-+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+
|F|E| Type = 5   | Length = 1       |   Transport   |
+-+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+
```

- **Transport** field is set to 0 for multicast transport and is set to 1 for unicast transport.

Receiver RLOC Attribute Format



- **Address Family** field carries the PIM Address Family of the receiver RLOC as defined in RFC4601
- **Receiver RLOC** field carries the RLOC address on which the receiver xTR wishes to receive the unicast-encapsulated flow

Wrap Up

- Adding support for unicast transport to LISP multicast PIM signaling
- Introducing the Transport and Receiver RLOC attributes to carry additional required information in LISP encapsulated (S-EID,G) Join/Prune PIM messages