

Root initiated routing state in RPL

draft-ietf-roll-dao-projection

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Changes Highlights

- New flag in the RPI to indicate projected route
 - Needed for error processing
- Text on RFC 8138, Need for compression & RPI update

Updating the RPI (RFC 6550 & RFC 6553)

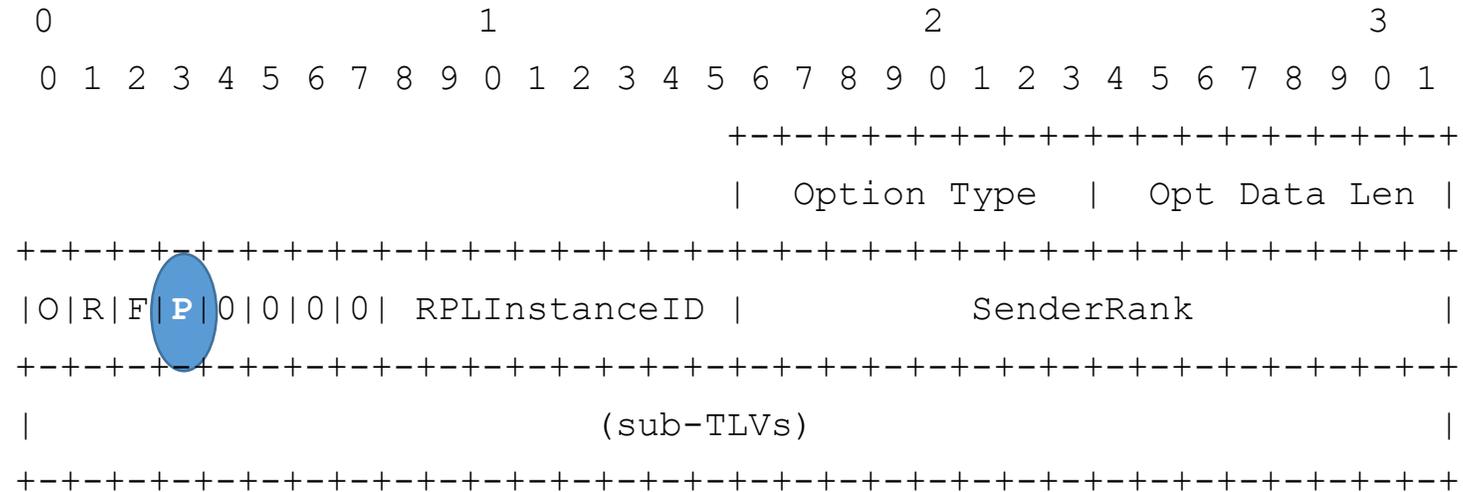


Figure 6: RPL Option

New fields:

P: 1-bit flag; indicates that the packet is routed along a projected route.

On RFC 8138 usage: ERPI

- RPI flags and Rank are useless along the projected route.
- On the other hand, we could use a new flag in the RPI to indicate that the route is a projected route in the non-storing case.
- Introduced an additional ERPI encoding that :
 - Is inspired from the existing RPI compression but is Elective
 - Does not contain a Rank information nor the flags
 - May Indicate projected route, another thread on that

On RFC 8138 usage: IP in IP

- An implementation is used to
 - IP in IP with SRH from the root to the last node indicated in the SRH or
 - IP in IP with no SRH from the node indicated as encapsulator to (implicitly) the root.
- For DAO projection we will use an SRH from the node indicated as encapsulator to the last node indicated in the SRH, which is a mix of the above. It is compatible with RFC8138 but possibly untried with existing code.
- Provided an example packet that has IP in IP and SRH and none of the outer IPs is the root

On RFC 8138 usage: IP in IP (cont.)

```
+--+ ... -+--+ ... +-+- ... -+--+ ... +-+--+--+ ... -+--+ ...
|11110001|SRH-6LoRH| ERPI- | IP-in-IP Encap | NH=1 |11110CPP|
|Page 1 |Type1 S=2| 6LoRH | 6LoRH sulator |LOWPAN_IPHC| UDP |
+--+ ... -+--+ ... +-+- ... -+--+ ... +-+--+--+ ... -+--+ ...
      <-RFC8138-><-This-><----RFC 8138-----><-----RFC 6282----->
              RFC          5 to 19 bytes          No RPL artifact
```

Figure 3: Example Compressed Packet with SRH.

Discussions needed to progress

How is the topology known to the root?

- Could use external management or Non-Storing DAO

- Time to do the RPL control plane compression

- Suggestion to add a peer info option similar to transit info option

- Suggestion to use connected dominating set of RPL parent (Cisco IPR)

How are the node capabilities known to the root?

- Suggestion to add a node capability option (in mop ext? ref mop ext?)

Complexity of mixed modes and route concatenation

MOP saturation: addressed by draft-rahul-roll-mop-ext

Compression of the Via Info option (so far full addresses)

- Time to do the RPL control plane compression

Discussions needed to progress

How is the topology known to the root?

Could use external management or Non-Storing DAO

Suggestion to add a peer info option similar to transit info option

Suggestion to use connected dominating set of RPL parent (Cisco IPR)

Time to do the RPL topology description draft

(in ROLL, in RAW?)

Discussions needed to progress (cont.)

How are the node capabilities known to the root?

Suggestion to add a node capability option

(in mop ext? or in this draft with a ref/dependency on mop ext?)

Complexity of mixed modes and route concatenation

MOP saturation: addressed by draft-rahul-roll-mop-ext

Compression of the Via Info option (so far full addresses)

Time to do the RPL control plane compression