draft-thubert-6man-flow-label-for-rpl-05

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Status

- 05 published

Includes

- Discussion on Why 6437 is harmful to LLN
- Request to push burden at LLN edge

What's new?

- Removed discussion on RPL option
- Extended scope to generic LLNs to include ISA100.11a networks (more in next slides)

LLN generic issue with RFC 6437

- 802.15.4 frames are 127 bytes long
- 6LoWPAN Header Compression compresses a null flow label efficiently
- But a non-zero flow label means
  - 20 bits across the LLN
  - Which consumes energy
  - Augmented chances of fragmentation
  - Augmented chances of frame loss
- With no value for the LLN

Root problem

RFC 6437:

"The complications described explain why the principal recommendation is that the source hosts should set the label."

- LLNs Nodes should not have to set the flow label if it has no value in the LLN.
- A waste of energy that will not be implemented.
- OTOH, the recommendation sh/could apply to the border router .
- In any case, remote nodes in the Internet will now have to set the Flow Label

The non-rewrite rule

RFC 6437:

A forwarding node MUST either leave a non-zero flow label value unchanged or change it only for compelling operational security reasons as described in Section 6.1.

- An opening from RFC 3697 for security
- Still a problem for LLN incoming packets
- The value is already consumed (load balancing in the core)
- LLNs border router should be allowed to reset the flow label of incoming packets

ISA100.11a

- A Significant step for IPv6 adoption in IoT
- Conforms RFC 3697 Flow Label specification
  + RFCs 768, 2460, 2988, 3610, 5405 & 6282
- The trick is that the app in the Internet never sets the Flow Label so it arrives as 0s
- And the contract ID placed there is a constant

The ISA100.11a behaviour was made non-conformant by RFC 6437 as a source app in the Internet must now set the Flow Label.

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RPL Packet Information

- An Option could be to transport it in FL
- 6TiSCH and ROLL now exploring 6lo alternate
- Outcome still unclear
- RPL Packet Info is modified at each LLN hop

The fact that current RFCs reject the capability to change the FL in LLN prevents that particular usage and played a significant role in the decision to try a 6lo approach.

Thank you!