(Flow Related) DLEP Extensions Update

Lou Berger lberger@labn.net
David Wiggins David.Wiggins@ll.mit.edu
Bow-Nan Chang bchang@ll.mit.edu
Update Summary

- 4 drafts accepted as WG documents
  - 2017-02-09 draft-ietf-manet-dlep-latency-extension-00
  - 2017-02-09 draft-ietf-manet-dlep-multi-hop-extension-00
  - 2017-02-09 draft-ietf-manet-dlep-pause-extension-00
  - 2017-03-13 draft-ietf-manet-dlep-da-credit-extension-01

- MIT-LL DLEP code published on github
  - DLEP stack code: https://github.com/mit-ll/LL-DLEP
  - Wireshark Dissector Plugin: https://github.com/mit-ll/dlep-wireshark-dissector

- The rest of this presentation will focus on open issues and next steps
## Latency & Multi-Hop

<table>
<thead>
<tr>
<th>Draft</th>
<th>Open Issues</th>
<th>Next Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>• <strong>DLEP Latency Range Extension</strong></td>
<td>• None known</td>
<td>• WG review and comments</td>
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<tr>
<td>o draft-ietf-manet-dlep-latency-extension-00</td>
<td></td>
<td>• Implementation?</td>
</tr>
<tr>
<td>o reports latency that may be experienced on</td>
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<td>• <strong>DLEP Multi-Hop Forwarding Extension</strong></td>
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<td>o reporting and control of multi-hop</td>
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Control Plane Based Pause Extension

- draft-ietf-manet-dlep-pause-extension-00

• A simple **control plane** based flow control mechanism
  - Modem can send DLEP messages to *pause* and *restart* traffic
  - Useful when a simple control plane “xon/xoff” capability is good enough
  - May be DSCP specific

• Open issue
  - Encoding
    - Details on next slide
  - Proposal from last meeting: DLEP Data Item *Containers*
    - Supporting lists and optional information elements
    - Some discussion on the topic, with agreement on direction among potential authors
      - But no draft published

• Next steps
  - Wait for DLEP Containers?
Pause Extension Open Issue

• 1 new Extension Type
  o *Control Plane Pause*

• 3 new Data Item Values
  o Queue Parameters

<table>
<thead>
<tr>
<th>Queue Index</th>
<th>...</th>
<th>Data Item Type</th>
<th>Length</th>
<th>Num Queues</th>
<th>Scale</th>
<th>Reserved</th>
<th>Queue Size Q0</th>
<th>Num DSCPs Q0(0)</th>
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</table>

Pause / Restart

<table>
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<tr>
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<th>...</th>
<th>Data Item Type</th>
<th>Length</th>
<th>Queue Size Qn</th>
<th>Num DSCPs Qn</th>
<th>...</th>
<th>Queue Size Qn</th>
<th>Num DSCPs Qn</th>
<th>...</th>
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Open issue:
• Encoding of [Queue, DSCP list] seems “complex”
• Should we wait for DLEP containers?

Queue Size is Informational
• A **DiffServ** aware credit-windowing scheme
  o More sophisticated flow control, for a wide range of applications
  o Flow control in one direction router ➔ modem

• **00 ➔ 01**
  o Clarified data *cannot* be sent when credit window is empty
  o Added Appendix A: Open and Resolved Issues

• **Issues**
  o 5 Open, covered in subsequent slides
  o 1 Resolved
    A.6: Adding bidirectional flow control
    o Agreement on list that not needed now, and can be added when needed as own extension

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**Draft Name:**
- draft-ietf-manet-dlep-da-credit-extension-01

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**Issues**
- Mainly reported by Stan
  o 5 Open, covered in subsequent slides
  o 1 Resolved
    A.6: Adding bidirectional flow control
    o Agreement on list that not needed now, and can be added when needed as own extension
Reminder: Credit Windowing Mechanisms

• 1 new Extension Type – *DiffServ Aware Credit Windowing*

• 2 new Messages
  o Credit Control and Credit Control Response
  o Modem → Router – credit increment
  o Router → Modem – status response, credit request

• 4 new Data Items
  o Queue parameters – Same as pause*
  o DA Credit Grant
    • Sets credit windows in Destination Up/Update/Announce Response messages
    • Increments windows in Credit Control messages
  o DA Credit Window Status
  o DA Credit Request
Issue A.1. Merge with draft-ietf-manet-credit-window

• There has been discussion and general agreement that dlep-da-credit-extension and credit-window should be merged

• The question is when
  o The authors propose to reach closure on core technical issues before merging
Issue A.2. Credit Windows Shared Across Destinations

• Current draft has credit windows per MAC address (destination)
• Some media technologies share queues across a set of destinations or even all destinations – this is not supported
  o Think multi-channel radio (or multiple lambdas/ITU-T media channels)
  o Clearly missing
Issue A.2. Shared Credit Windows (cont.)

- Proposed solution
  - Replace current queue definition with a per credit window data item
    - With a credit window identifier (CID)
  - CIDs can be shared or per MAC destination
    - Shared CID defined* in Session Initialization Response and Session Update messages
    - Per MAC CID defined* in Destination Up, Announce Response and Update messages
  - MAC associated CID defined in Destination Up, Announce Response and Update messages
  - Credit increments basically unchanged
    - Need to decided if reset is same or different data item

Credit Window Data Item

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| +------------------------------------------+--+
| | Data Item Type | Length |
| | +------------------------------------------+--+
| | Credit Window Identifier (CID) | Reserved* |
| | +------------------------------------------+--+
| | | Initial Credits |
| | +------------------------------------------+--+
| | | Initial Credits |
| | +------------------------------------------+--+
| | Scale | Credit Window Size |
| | +------------------------------------------+--+
| | Num DSCPs | DS Field 1 | DS Field 2 | ... |
| | +------------------------------------------+--+
| | ... | DS Field n |

* -- Typically

Initial credit window may be provided
Issue A.3. Supporting Router Limits

- Routers may have limits, and there is no way for such to be reported to modems
  1. Routers may support fewer credit windows than a modem
  2. Routers may not support per destination credit windows, i.e., only support DSCP based credit windows
- Other error cases are possible too
  3. The CIDs associated with a MAC destination may have duplicate DSCPs
- Some options for discussion
  - For {1, 2} – router provides capabilities during session establishment
  - For 3 – Error in Credit Control message, or just log
  - <other options from session?>
Issue A.4. Absolute vs Increment

• Proposal: replace credit window increments with absolute sets
  o Sets currently using for initialization and resynchronization
  o Proposed by Stan Ratliff <ratliffstan@gmail.com>

• Next steps
  o Is anyone interested in experimenting with this?
  o Other thoughts?
Issue A.5. Alternate Format Encoding

• Proposal to use Data Item Containers to simplify encoding of the Queue Parameters Data Item

• Queue Data Item is being replaced with Credit Window Data Item
  o With this change this issue will only apply to the Pause Extension draft
Next Steps

• Move forward as discussed today
  o draft-ietf-manet-dlep-latency-extension
  o draft-ietf-manet-dlep-multi-hop-extension

• Update drafts as discussed today
  o draft-ietf-manet-dlep-pause-extension
  o draft-ietf-manet-dlep-da-credit-extension