RAW multidomain extensions

draft-bernardos-raw-multidomain-00

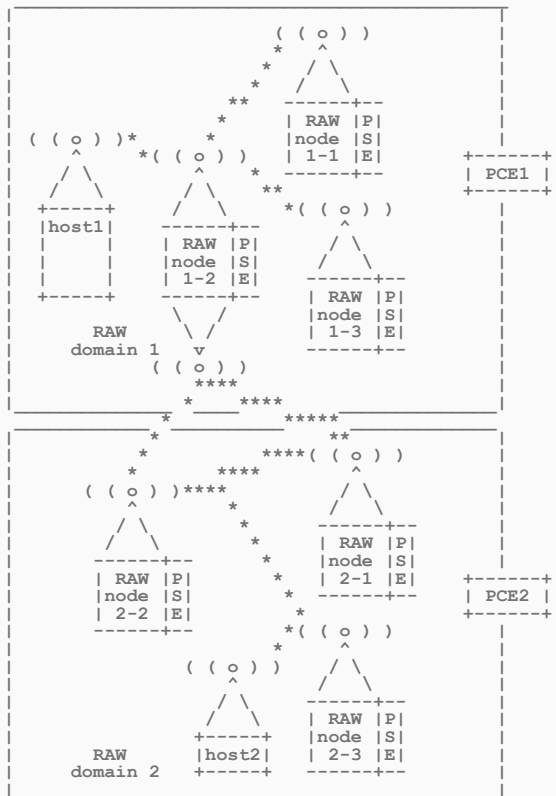IETF 115 – RAW WG

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Aim and scope

- Current scope of the WG is mostly focused on single-domain
- There are scenarios requiring multidomain RAW
  - where hosts are connected to different RAW domains and they need to communicate to each other with certain   reliability and/or availability guarantees
  - E.g., in large factories where networks might be organized in domains (per production lines or building/sites)
- Goal is to explore current RAW multi-domain gaps (arch, OAM, etc) and propose solutions

```
                      ( ( o ) )
                          *
                        * *
                       * *
                      **      ------+--
                     *        | RAW |P|
( ( o ) )*      *             |node |S|      +------+
   ^        *( ( o ) )        | 1-1 |E|      | PCE1 |
  / \      ^   ^     *        ------+--      +------+
 /   \    /   /        **
+-----+  /  ------+--    *( ( o ) )
|host1| /   | RAW |P|        ^
|     | |   |node |S|       / \
|     | |   | 1-2 |E|      /   \
+-----+ |   ------+--     ------+--
        |    \   /        | RAW |P|
      RAW     \ /         |node |S|
    domain 1   v          | 1-3 |E|
             ( ( o ) )     ------+--
              ****
            *      ****
           *        *****
          *            **
         *            ****( ( o ) )
        *          ****       ^
( ( o ) )****       *        / \
   ^                *       /   \
  / \               *      ------+--
 /   \              *      | RAW |P|
------+--           *      |node |S|
| RAW |P|           *      | 2-1 |E|      +------+
|node |S|           *      ------+--      | PCE2 |
| 2-2 |E|           *( ( o ) )            +------+
------+--            *      ^
        ( ( o ) )    *     / \
           ^         *    /   \
          / \             ------+--
         /   \            | RAW |P|
        +-----+           |node |S|
      RAW     |host2|     | 2-3 |E|
    domain 2  +-----+     ------+--
```

- Two domains, each one with its own PCE
- Domains might be interconnected via multiple paths
- Multiple gaps:
  - Domains need to set up the inter-domain connectivity (this might need discovery)
  - Multi-domain paths need to be discovered
    - There is inter-PCE work
    - Inter-domain PSE coordination

3

```
+-----+-+       +----+          +----+          +-----+-+          +-----+-+
| RAW |P|       |    |          |    |          | RAW |P|          | RAW |P|
|node |S|       |PCE1|          |PCE2|          |node |S|          |node |S|
| 1-2 |E|       |    |          |    |          | 2-1 |E|          | 2-2 |E|
+-----+-+       +----+          +----+          +-----+-+          +-----+-+
     |            |               |                |                 |
1.Path compute req|               |                |                 |
(src=node1-2,     |               |                |                 |
 dst=node2-3, SLA)|               |                |                 |
     |·········>|                 |                |                 |
     |          |2.Path compute req                |                 |
     |          |(src={node2-1,node2-2},           |                 |
     |          | dst=node2-3)                      |                 |
     |          |·········>|                        |                 |
     |          |3.Path compute resp                |                 |
     |          |({tracks2},{links_quality})|       |                 |
     |          |<·········|                        |                 |
4.Path compute resp         |                        |                 |
({{tracks1},{tracks2}},     |                        |                 |
 PSE={node2-1,node2-2},     |                        |                 |
 {SLA1,SLA2})     |         |                        |                 |
     |<·········|           |                        |                 |
     |5.RAW inter-domain path |                       |                 |
     |({{tracks1,tracks2}},{SLA1,SLA2})               |                 |
     |·············································>|                    |
     |···················································>|              |
     |            |          6.RAW inter-domain path ACK             |
     |<·······································|                        |
     |<····················································|          |
     |            |               |                |                 |
     |7.RAW OAM(flow/track,SLA1)  |                |                 |
  <···>|<···>     |               |  7.RAW OAM(flow/track,SLA1)|      |
     |            |               |          <··>|<··>    <··>|<··>  |
     |         8.RAW OAM (flow/track, metrics)     |                 |
     |<·······································>|                     |
     |<····················································>|        |
     |            |               |                |                 |
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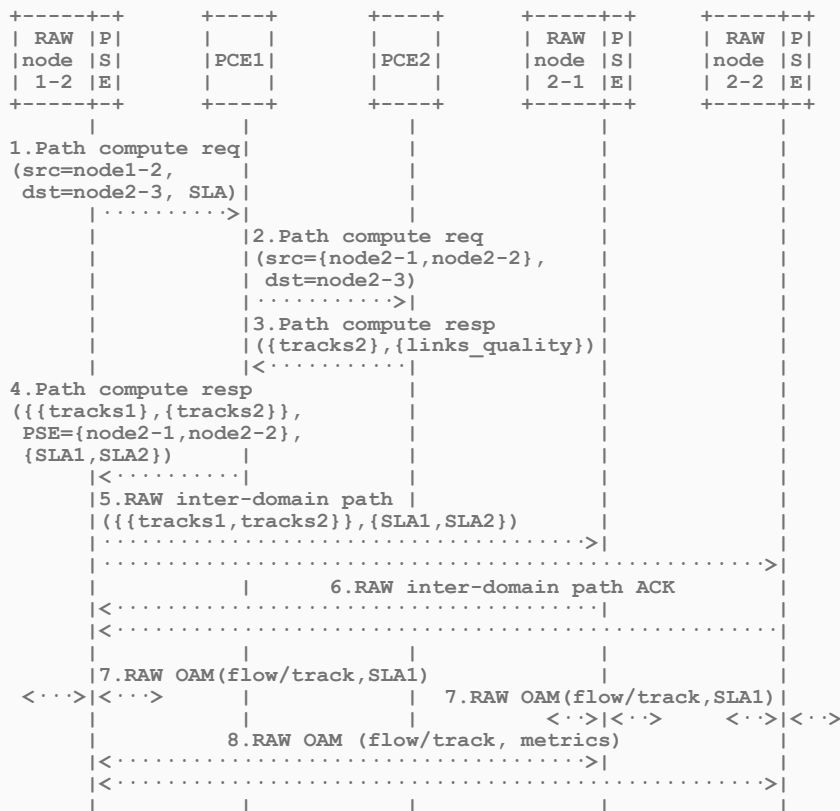
Summary and next steps

- Is there interest in this problem in the WG?
  - Many gaps to identify and address (e.g., OAM)
  - Potential new protocol work needed
  - Relation to DETNET
    - Discussion also started at DETNET WG (triggered in an interim meeting)
      - https://datatracker.ietf.org/doc/draft-bernardos-detnet-multidomain/

- Please share your comments on the ML

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