Multicast On-path Telemetry using IOAM

draft-ietf-mboned-multicast-telemetry-03

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Revision updates

- Reference documents updated
  - IOAM Data has been published as RFC9197
  - IOAM DEX has been submitted to IESG for publication

- The schemes in this document are updated to comply with the IOAM trace option specified in RFC9197 and IOAM DEX (to be published)
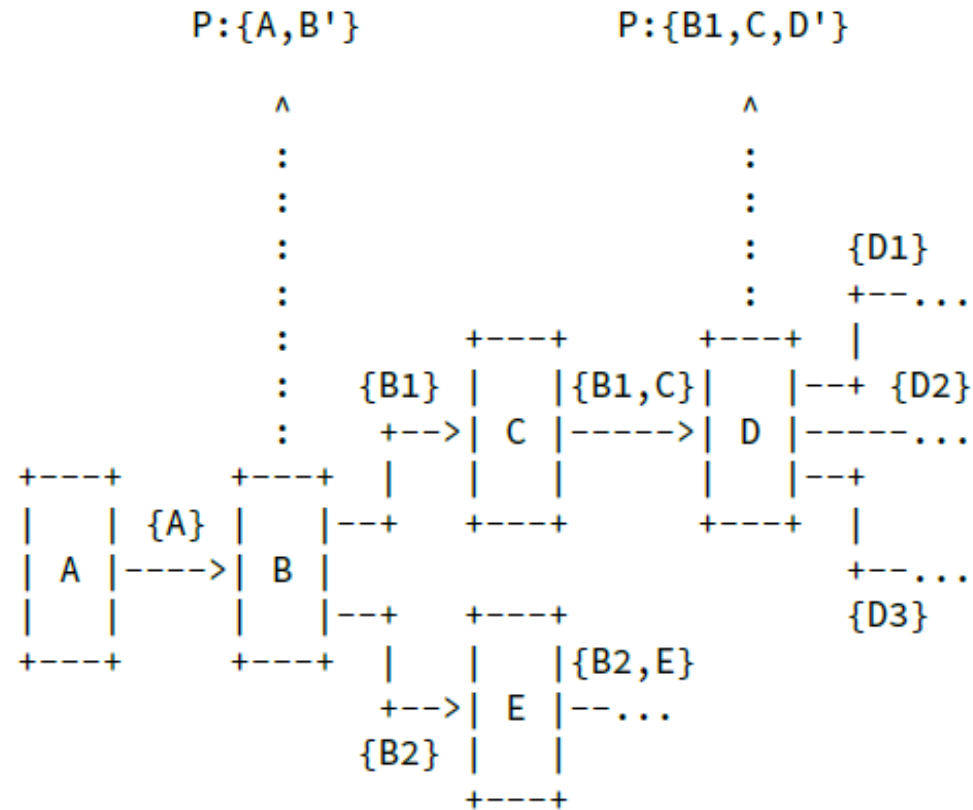
Problem Statement and Method Recap

- On-path telemetry is useful for multicast traffic monitoring

- IOAM trace option introduces considerable data redundancy

- Two Solutions
  - Based on IOAM Trace option
  - Based on IOAM DEX

IOAM Trace Option-based Solution (1)

- IOAM Trace: telemetry data are accumulated in user packet as a trace
- In multicast, the previous data are copied to each branch, introducing redundancy
- Solution: combine IOAM trace and the postcard-based telemetry
- Configure each branching node to export the data trace collected so far and clear the trace in user packets
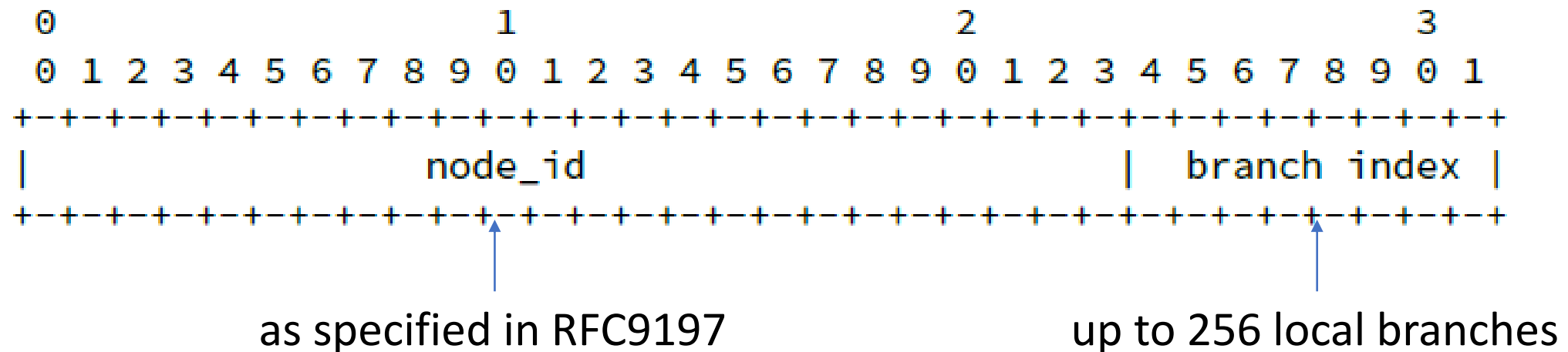- No update to RFC9197, only need control plane configuration

IOAM Trace Option-based Solution (2)

```
         P:{A,B'}                     P:{B1,C,D'}

            ^                             ^
            :                             :
            :                             :
            :                             :        {D1}
            :                             :         +--...
            :            +---+       +---+ |
            :    {B1} |     |{B1,C}|     |--+ {D2}
            :         +-->| C |----->| D |-----...
 +---+          +---+   |   |   |       |   |--+
 |   | {A} |       |--+   +---+       +---+ |
 | A |---->| B |            +---+             +--...
 |   |       |   |--+   +---+               {D3}
 +---+       +---+ |   |   |{B2,E}
                    +-->| E |--...
                 {B2} |   |
                       +---+
```
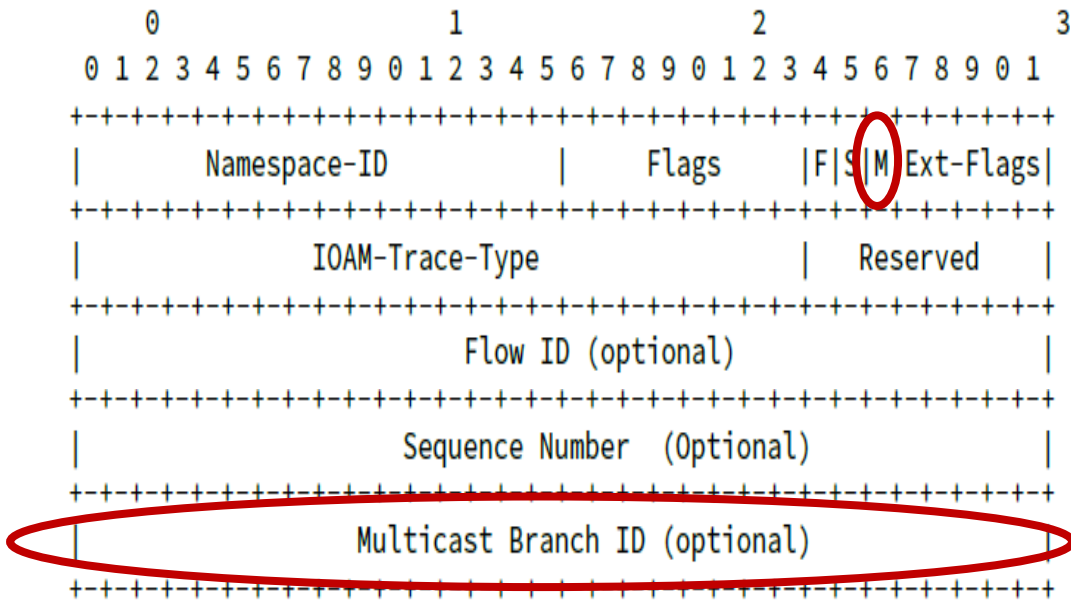
- For multicast tree reconstruction
  - Node ID data is mandatory
  - Each section's trace needs to include the branching node
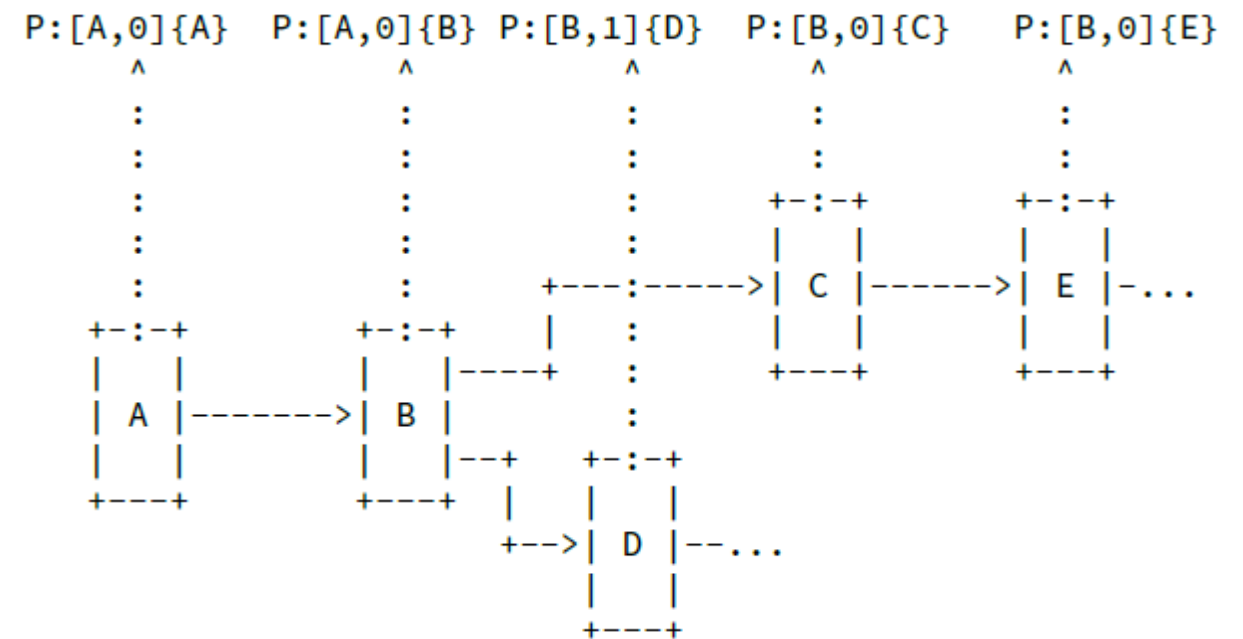
IOAM DEX-based solution (1)

- IOAM-DEX: telemetry data sent as independent postcards based on an instruction header at each hop

- In multicast, branch identifier is needed to reconstruct the multicast tree

- Solution: instruction contains a global unique branch identifier

```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                    node_id                    | branch index  |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

as specified in RFC9197   up to 256 local branches

IOAM DEX-based solution (2)

Update to IOAM DEX Header

Application Example

Next Step

- Request for WGLC