Extended OAM to Convey In-situ OAM Configuration State

draft-xiao-ippm-ioam-conf-state-00

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Intention of this draft

- Provide a method for the IOAM encapsulating node to determine IOAM header

  – Static configuration is a potential method, but it's uneasy and inflexible, especially when the IOAM encapsulating node is a host

  – Dynamic acquisition is proposed in this draft, traditional OAM mechanisms such as ICMP Ping or MPLS LSP Ping can be used to convey IOAM configuration state

Principle of this draft
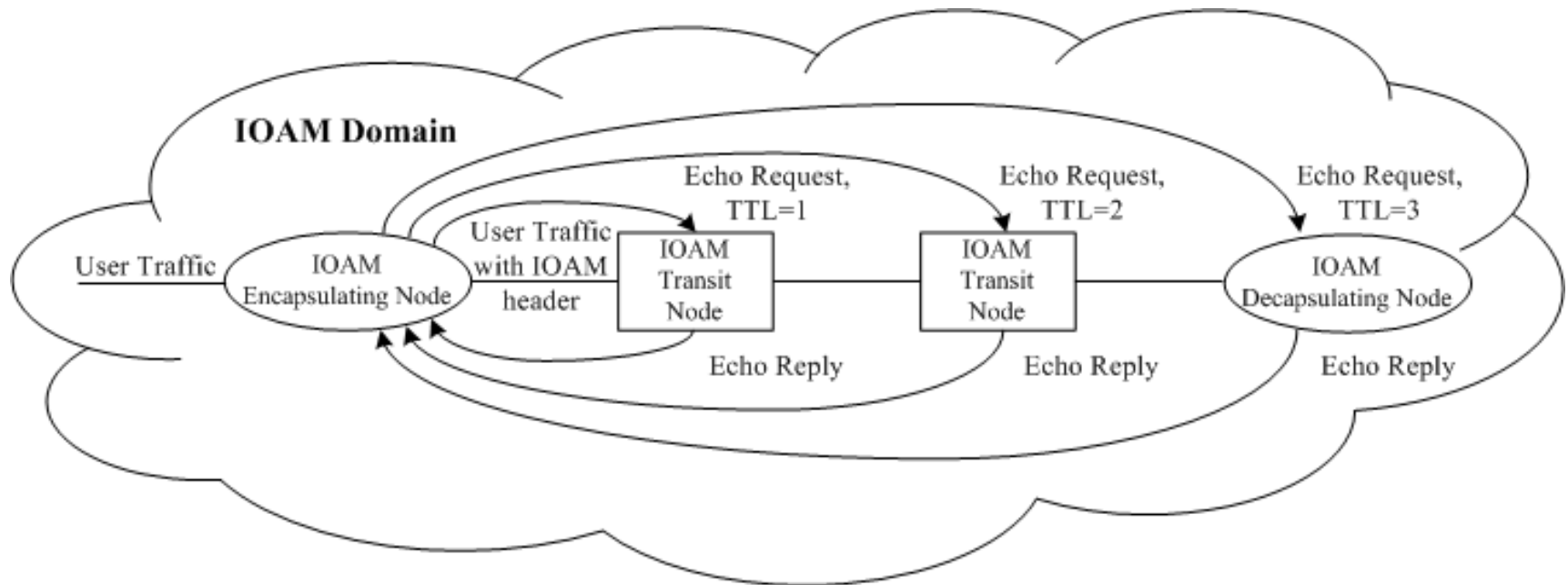
- the principle of this draft is straightforward
  - IOAM configuration data is conveyed from the IOAM transit/decapsulating nodes to the IOAM encapsulating node, by specific OAM probe packets

New TLV in Echo Request

```
 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
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
| Type = IOAM Configuration Data|              Length           |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                              Value                            |
.                                                               .
.                                                               .
.                                                               .
|                                                               |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```
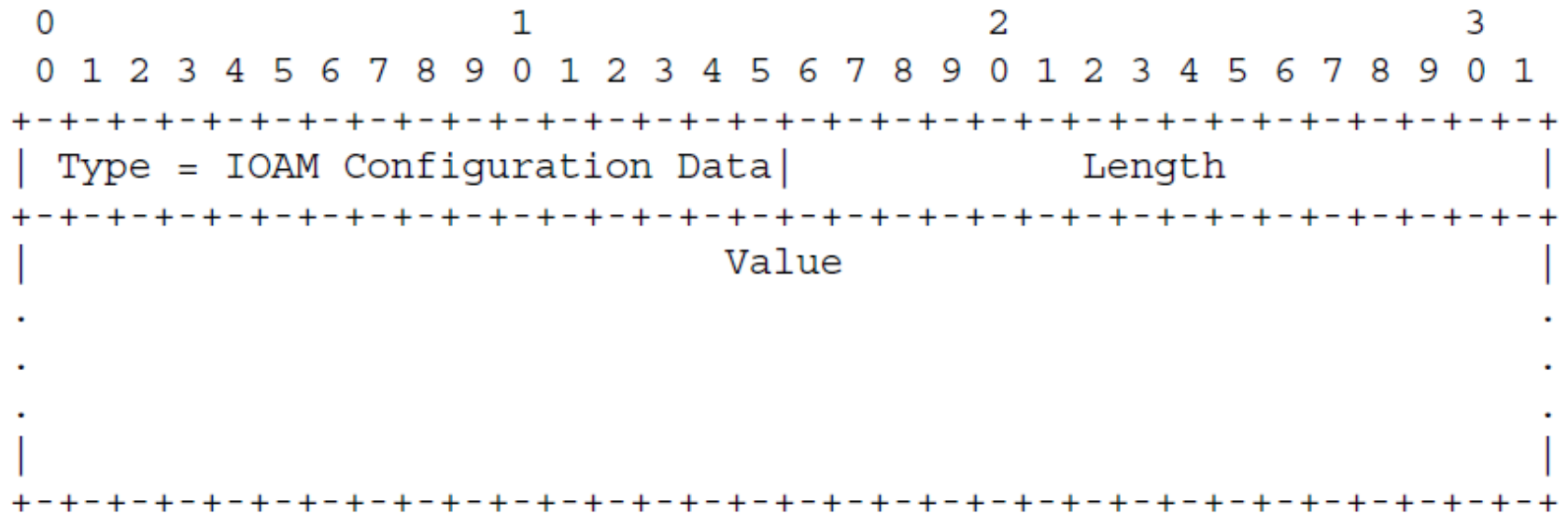
Figure 1: IOAM Configuration Data TLV

- When this TLV is present in Echo Request, it means that the IOAM encapsulating node requests the receiving node to reply with its IOAM configuration data

New TLV in Echo Reply

```
 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
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
| Type = IOAM Configuration Data|             Length            |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                             Value                             |
.                                                               .
.                                                               .
.                                                               .
|                                                               |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```
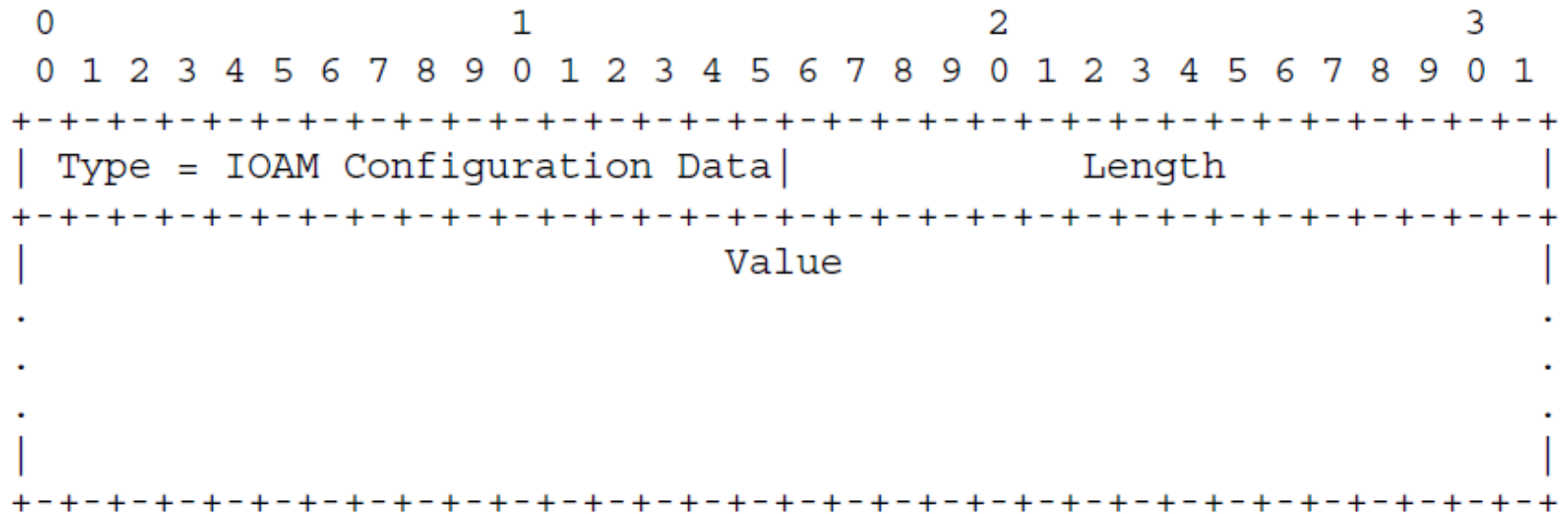
Figure 1: IOAM Configuration Data TLV

- When this TLV is present in Echo Reply, it means that IOAM function is enabled at this sending node and this TLV contains IOAM configuration data of the sender

IOAM Tracing Configuration Data sub-TLV

```
 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
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
| Sub-type = Tracing Conf Data  |              Length           |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|F|      IOAM-Trace-Type         |NodeLen|        Reserved       |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```
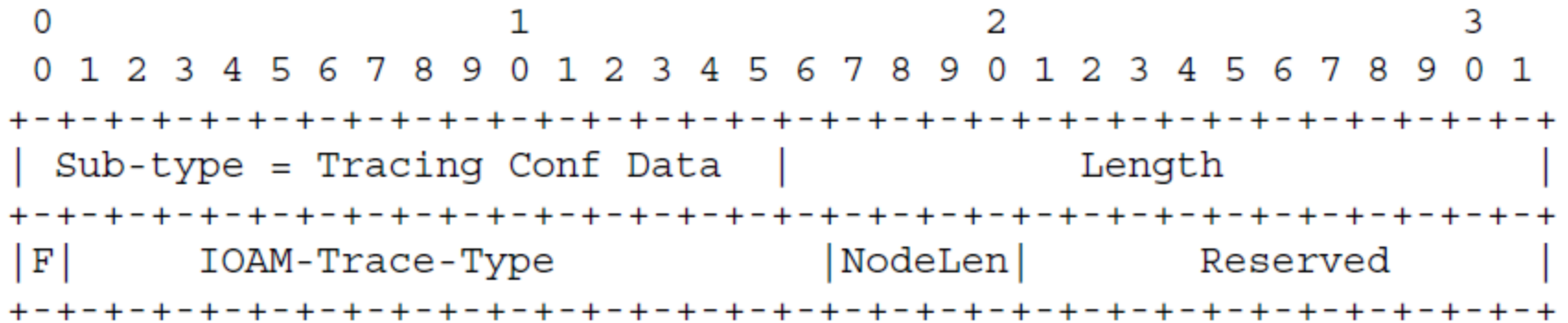
Figure 2: IOAM Tracing Configuration Data Sub-TLV

- When this sub-TLV is present in the IOAM Configuration Data TLV, it means that the sending node is an IOAM transit node and IOAM tracing function is enabled at this IOAM transit node

IOAM Proof of Transit Configuration Data sub-TLV

```
 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
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|    Sub-type = POT Conf Data       |            Length         |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|IOAM-POT-Type|P|SoR|              Reserved                     |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```
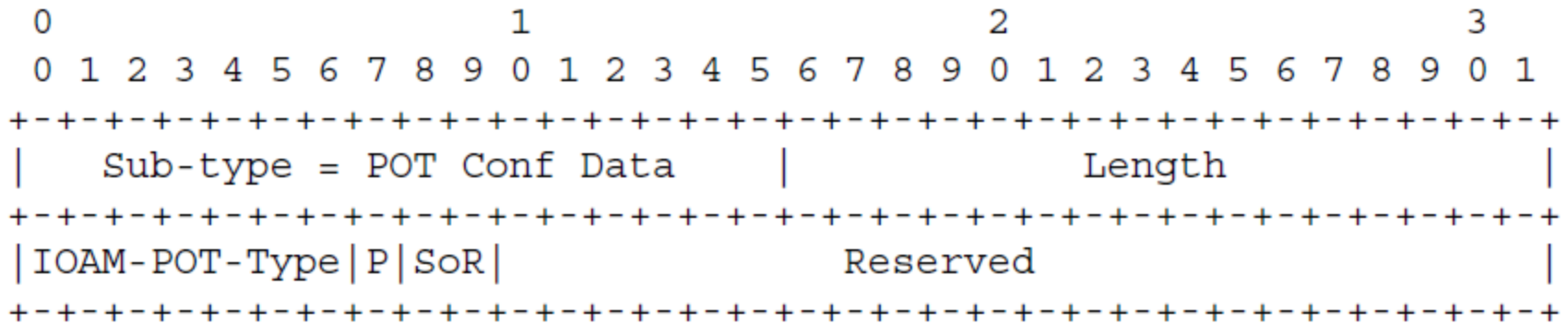
Figure 3: IOAM Proof of Transit Configuration Data Sub-TLV

- When this sub-TLV is present in the IOAM Configuration Data TLV, it means that the sending node is an IOAM transit node and IOAM proof of transit function is enabled at this IOAM transit node
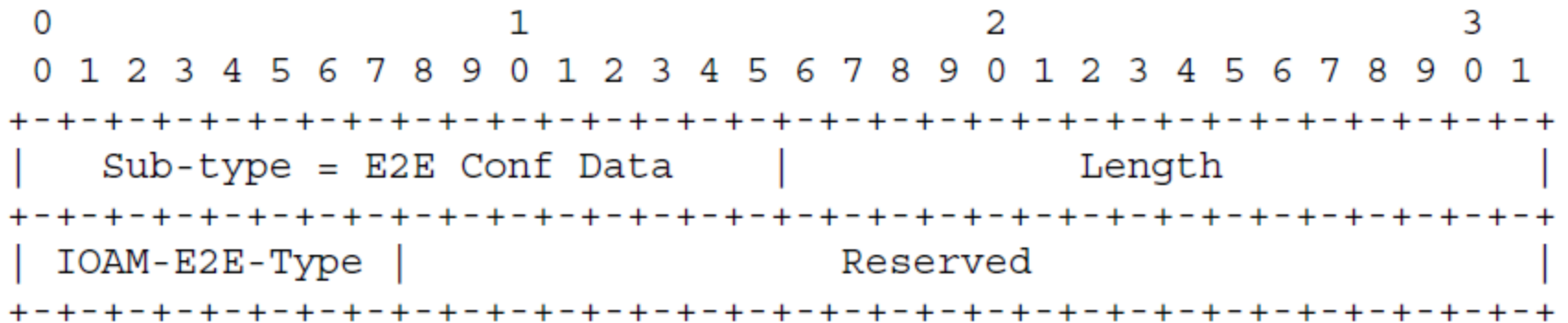
IOAM Edge-to-Edge Configuration Data sub-TLV

```
 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
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|    Sub-type = E2E Conf Data      |             Length         |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
| IOAM-E2E-Type |                 Reserved                      |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

Figure 4: IOAM Edge to Edge Configuration Data Sub-TLV

- When this sub-TLV is present in the IOAM Configuration Data TLV, it means that the sending node is an IOAM decapsulating node and IOAM edge to edge function is enabled at this IOAM decapsulating node
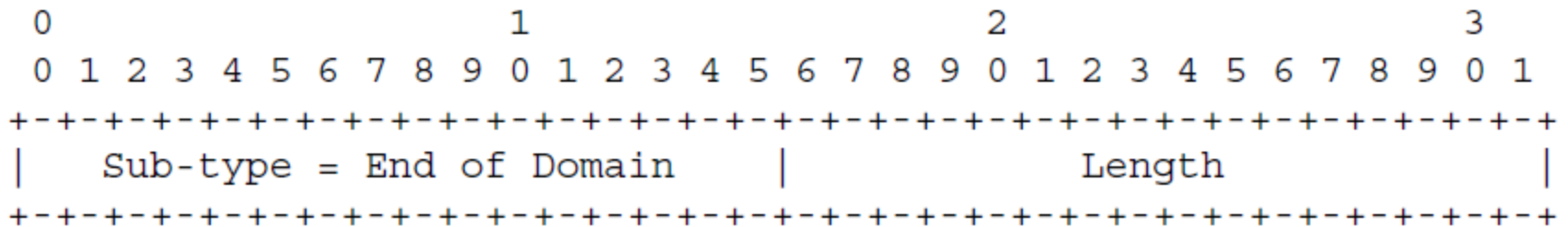
IOAM End-of-Domain sub-TLV

```
 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
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|   Sub-type = End of Domain        |              Length       |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

Figure 5: IOAM End of Domain Sub-TLV

- When this sub-TLV is present in the IOAM Configuration Data TLV, it means that the sending node is an IOAM decapsulating node

Next steps

- Ask for more reviews and comments
- Revise this draft to resolve comments
- Ask for WG adoption