DetNet SRv6 Data Plane Encapsulation

draft-geng-dp-sol-srv6-01

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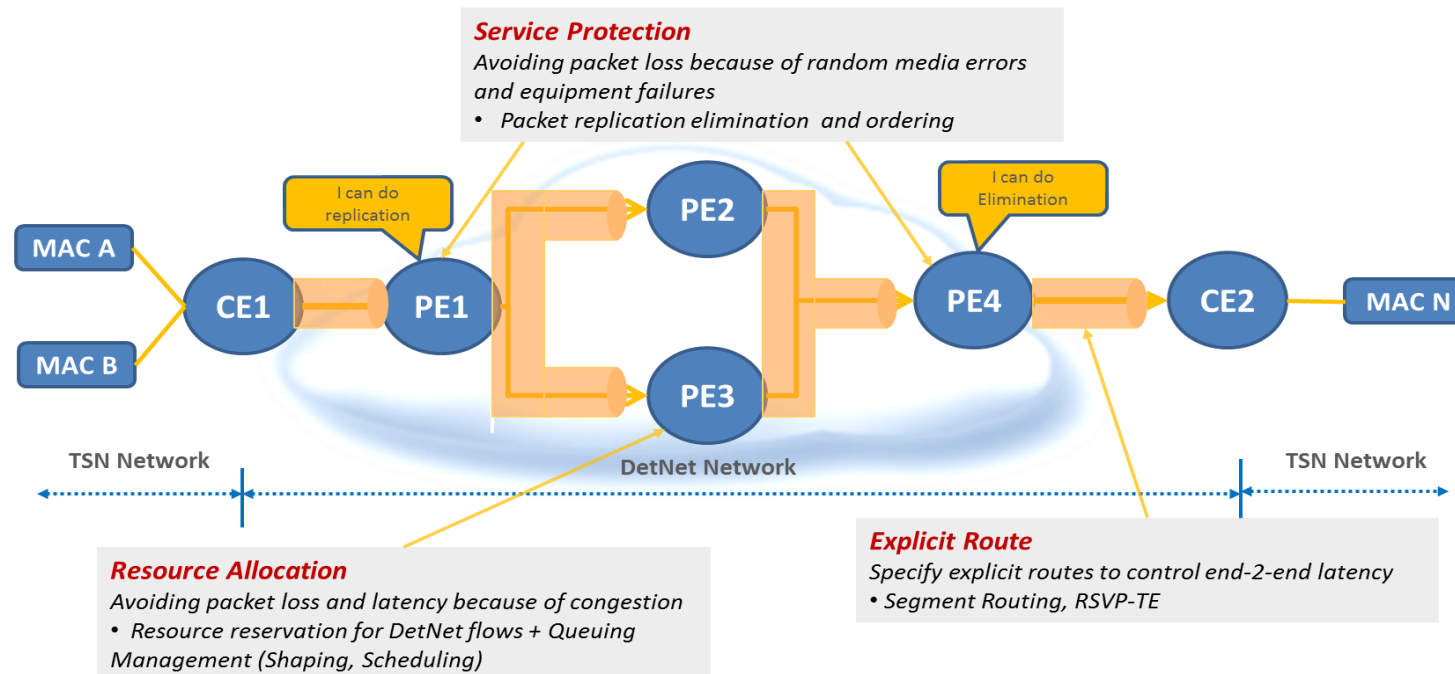Yongqing Zhu (zhuyq.gd@chinatelecom.cn)

DetNet Overview

- Key Features

  - DetNet provides a capability to carry specified unicast or multicast data flows for real-time applications with extremely low data loss rates and bounded latency within a network domain.

- Key Technologies

  - Resource Allocation / Service Protection / Explicit Route

Service Protection
Avoiding packet loss because of random media errors and equipment failures
- Packet replication elimination and ordering

I can do replication

I can do Elimination

MAC A

MAC B

CE1

PE1

PE2

PE3

PE4

CE2

MAC N

TSN Network

DetNet Network

TSN Network

Resource Allocation
Avoiding packet loss and latency because of congestion
- Resource reservation for DetNet flows + Queuing Management (Shaping, Scheduling)

Explicit Route
Specify explicit routes to control end-2-end latency
- Segment Routing, RSVP-TE

DetNet SRv6 Data Plane Requirement

- A method of identifying the SRv6 payload type;

- A suitable explicit route to deliver the DetNet flow ; (e.g., Segment List in SRH)

- A method of indicating packet processing, such as PREOF(Packet Replication/Elimination/Ordering Function); (detailed in next slides)

- A method of identifying the DetNet flow; (detailed in next slides)

- A method of carrying DetNet sequence number; (detailed in next slides)

- A method of carrying queuing and forwarding indication to do congestion protection; (not covered in the current version)

DetNet SRv6 Data Plane Solution

Flow Identification(20bits) and Sequence Number(28bits)

are carried in:

- **Option1:** SRH TLVs

- **Opiton2 :** arguments in the SID for Relay Node

- **Option3:** DetNet SID in segment list

```
 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
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
| Next Header   | Hdr Ext Len   | Routing Type  | Segments Left |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
| Last Entry    |     Flags     |              Tag              |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                                                               |
②          Segment List[0] (128 bits IPv6 address)             |
|                                                               |
|                                                               |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                                                               |
|                                                               |
                              ...
|                                                               |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                                                               |
③          Segment List[n] (128 bits IPv6 address)             |
|                                                               |
|                                                               |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
//                                                             //
// ①        Optional Type Length Value objects (variable)     //
//                                                             //
//                                                             //
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```