

DetNet

IP PSN vs. MPLS PSN A DetNet perspective

Based on many discussions on the mailing list ...

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DetNet WG

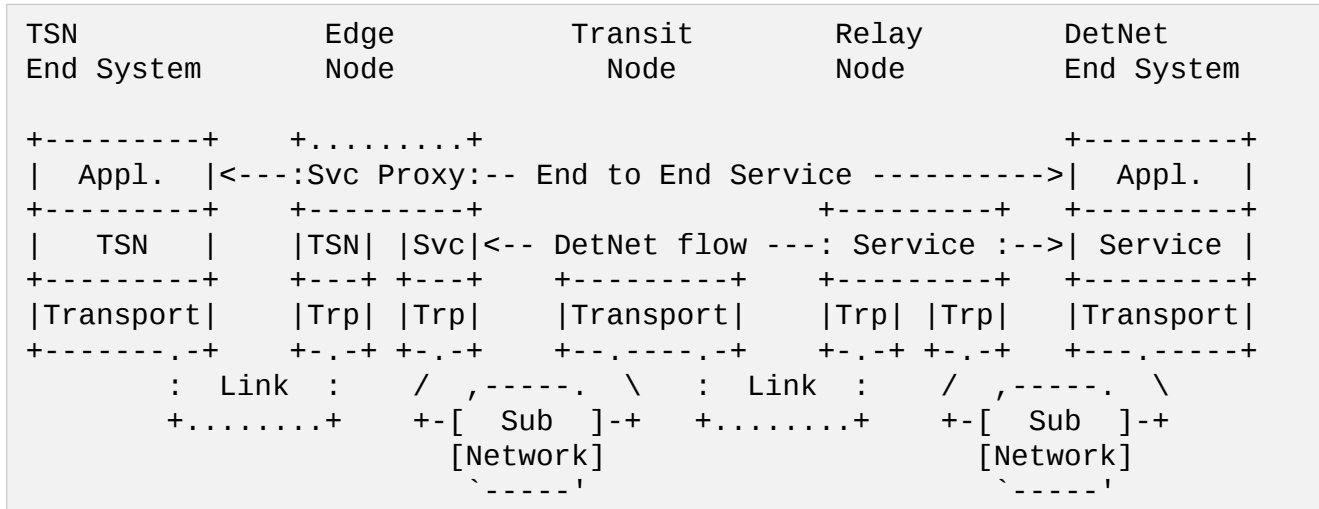
Interim, 14th February, 2018

DetNet functions & nodes

(as per draft-ietf-detnet-architecture)

- DetNet functions
 1. Congestion protection (Queuing) need: flow-ID
 2. Explicit routes (TE) need: flow-ID
 3. Service protection (PREF, IOD) need: flow-ID + Seq#

Note: These three techniques can be applied independently ...

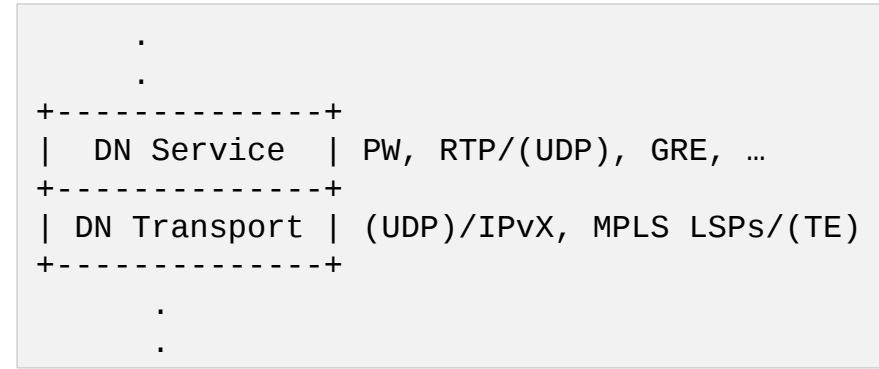


- DetNet nodes
 - Edge node req.functions: 1, 2, 3
 - Relay node req.functions: 1, 2, 3
 - Transit node req.functions: 1, 2

Encapsulation? ...

Yes please, a DetNet pseudowire (DN-PW)

- Encapsulation options analyzed in “draft-ietf-detnet-dp-alt”
 - DN Service layer
 - DN Transport layer
- Criteria for data plane solution alternatives
 - #1 ... #10



- Application flow (Appl-PDU) encapsulated by end-system
 - Appl-PDU_over_Ethernet
 - Appl-PDU_over_IP
 - And it may have its own proprietary fields ...
- Within the DN domain
 - We do not define end-system encapsulation format, we should be agnostic
 - We assume some kind of PW for the DN flow \Rightarrow build a concept based on spirit of rfc3985 + extended with IP as “emulated service”

DN-PW over PSN

based on spirit of rfc3985

- What is needed for DN-PW?
 - Flow-ID
 - Seq#

IP PSN

-----+-----	-----+-----
Payload -----> Raw payload if possible	
/=====\ H Payload Convergence H-----+>	-----+-----
H-----H / +-----+-----	L2TPs, seq #, etc.
H Timing H-----/---->	-----+-----
H-----H / +-----+-----	
H Sequencing H-----one of	-----+-----
\=====/ PW Demultiplexer -----+>	-----+-----
+-----+-----	L2TP, MPLS, etc.
+-----+-----	+-----+-----
PSN Convergence ----->	-----+-----
+-----+-----	Not needed
+-----+-----	+-----+-----
PSN ----->	-----+-----
+-----+-----	IP
+-----+-----	+-----+-----
Data-Link ----->	-----+-----
+-----+-----	Data-link
+-----+-----	+-----+-----
Physical ----->	-----+-----
+-----+-----	Physical
+-----+-----	+-----+-----

dispensable

- What is ~~NOT~~ needed for DN-PW?
 - Timing
 - Flags, Frag

MPLS PSN

-----+-----	-----+-----
Payload	-----+-----
/=====\ H Payload Convergence H-----+>	-----+-----
H-----H +-----+-----	
H Timing H----->	-----+-----
H-----H +-----+-----	
H Sequencing H-----+>	-----+-----
\=====/ PW Demultiplexer ----->	-----+-----
+-----+-----	L2TPs, Seq #, etc.
+-----+-----	+-----+-----
PSN Convergence -----+>	-----+-----
+-----+-----	PW Label
+-----+-----	+-----+-----
PSN -----+>	-----+-----
+-----+-----	Outer Label or MPLS-in-IP encaps
+-----+-----	+-----+-----
Data-Link	-----+-----
+-----+-----	Data-link
+-----+-----	+-----+-----
Physical	-----+-----
+-----+-----	Physical
+-----+-----	+-----+-----

The common denominator: PW-label + Control-word

Implementation?

Simplicity ...

- Simplicity is the ultimate sophistication ...
- Should we bind end-system and DN domain encapsulation?
 - We intend to be end-system agnostic ...
 - Appl-PDU will be tunneled anyway and encapsulated by DN Edge node
 - Target of DN encapsulation: add flow-ID, Seq# + forwarding-rules
- Ask the right question(s):
 - Why to have different DN PW format for IP and MPLS?
 - Why to implement DN functions twice (for both PSN type)?

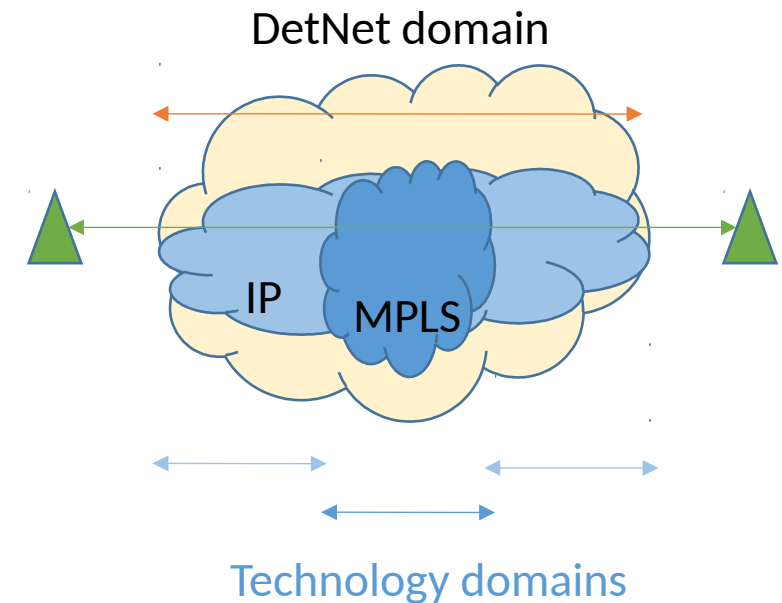
!!! NOTE !!! We can split the data plane document

2/14/2018

- if that helps to involve experts of IP / MPLS forwarding paradigm ...

Encapsulation examples

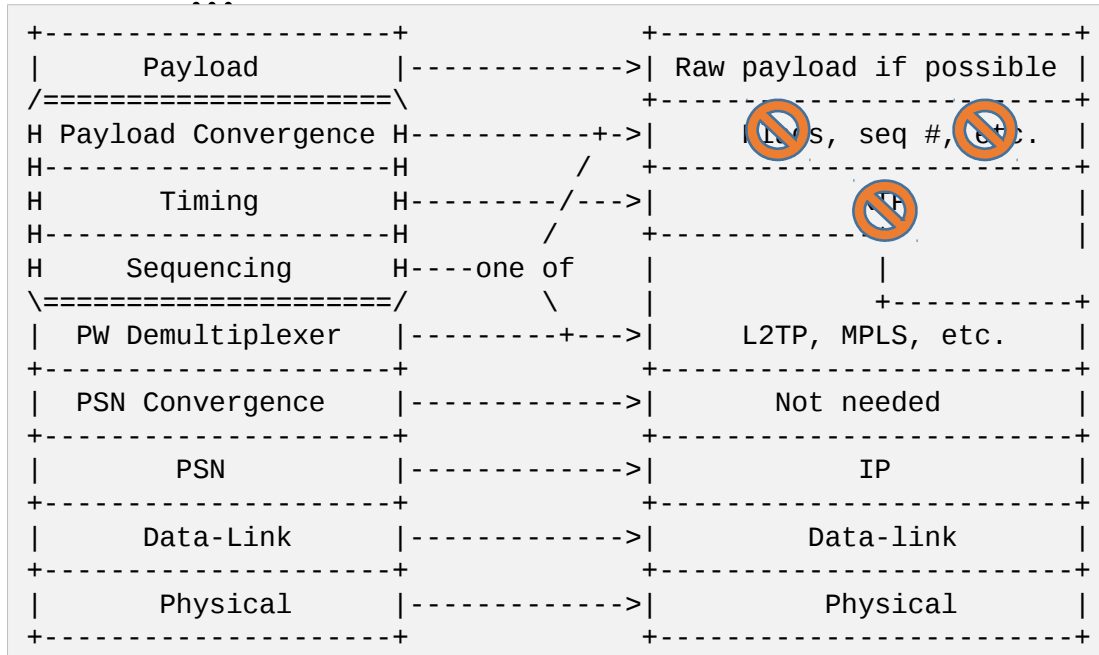
- IP PSN
 - Appl-PDU_o_PW+CW_o_IP
or
 - Appl-PDU_o_PW+CW_o_UDP_o_IP
- MPLS PSN
 - Appl-PDU_o_PW+CW_o_LSP
- Conclusion stops here for DetNet WG (so far)
 - Flow-ID and Seq# encoded using PW+CW
 - Different technology domains have to interwork
 - Difficulties at IP and MPLS domain borders minimized by common DN encapsulation



Further possible work

- To be done together with corresponding WGs
- How to make flow identification easier for Transit nodes?
 - Leverage PSN convergence layer
 - Both for IP PSN and MPLS PSN scenarios

• IP PSN



MPLS PSN

