

# Technical Requirements of Bounded Latency in Large-scale DetNet Deployment

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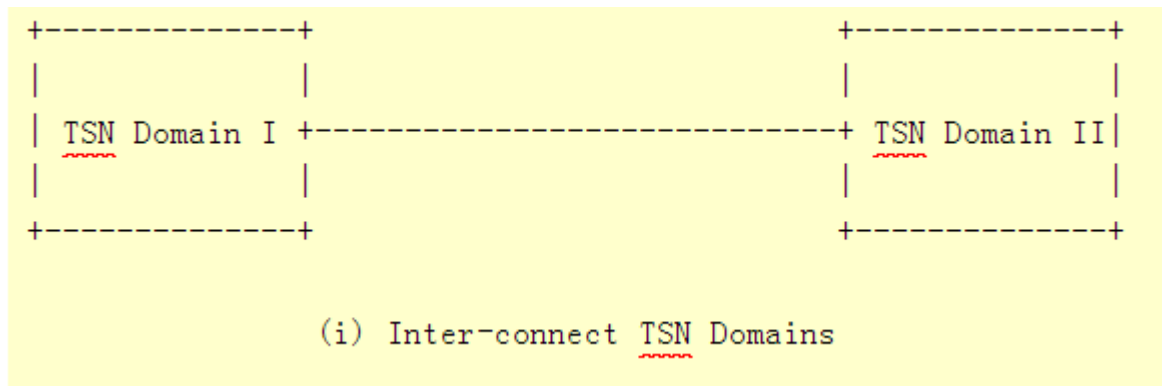
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# Background

- DetNet Definition and Architecture
- Encapsulation methods with specific mechanisms for identification of DetNet services
- Approaches for reliable transmission (Another way of understanding “deterministic”)
- Security requirements
- However there is yet a solution for deterministic latency
  - TSN was assumed but is it feasible for Large Scale?

# Large-scale Deployment Requirements

- Req 1: Stitching TSN domains with bounded latency
  - Given Detnet is chosen for connection between TSN Domains
  - Option 1: End-to-end TSN with time synchronization
  - Option 2: Native Detnet dataplane solution to maintain TSN jitter performance



# Large-scale Deployment Requirements

- Req 2: Fast convergence as new services are created
  - Qbv requires end-to-end re-mapping? as new flows are created in a TSN domain.
  - DetNet services are more diverse – frequent establish/tear-down of services
- Req 3: Tolerance of a certain level of end-to-end time deviation
  - Difficult to maintain end-to-end time synchronization in a large-scale heterogeneous network
  - Preferred to maintain bounded latency in unsynchronized environment

# Large-scale Deployment Requirements

- Req 4: Fine-grained and scalable resource reservation method
  - Given the variety of DetNet services, flow resource reservation status are preferred to be aggregated to some extent.
  - Certain trade-off needs to be studied carefully to achieve optimal performance
- Req 5: Tolerance of transmission latency
  - Sensitive jitter performance subject to transmission latency (IEEE802.1Qch),  $\Delta t \ll T$ , otherwise  $T$  (Jitter's upper bound is  $2T$ ) scales



# Conclusion

- There is yet a native Detnet solution for deterministic latency transmission
- Solution could be based on Qch but has to be scalable
- Time synchronization is preferred not to be a must