DetNet Architecture

draft-finn-detnet-architecture

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DetNet Architecture

- Objective/purpose of document
  - Goals
  - Non-goals
- Current status
- Essential aspects of the architecture
- Open issues questions/discussion
- Plans
- Open discussion

Objectives / goals

- To define an architecture that:
  - Provides assured maximum latency and extremely low packet loss rates for fixed-bandwidth critical streams
  - Across a mixed bridged and routed network
  - Taking advantage of IEEE 802.1 TSN standards
  - Without disrupting existing Qualities of Service,
  - While adding and/or modifying as few concepts, hardware requirements and protocols as possible.

Objectives / non-goals

- Critical streams have fixed bandwidth; congestion control via feedback / throttling is not an option.

- Tunneling through L3 networks to connect L2 TSN domains is not precluded, but is not a specific goal; target applications' networks are often too big for L2 connectivity.

- Precise time synchronization is typically required by the target applications, and by some proposed DetNet queuing techniques, but is not an objective of DetNet.

Current status

- draft-finn-detnet-architecture-06 uploaded on 8 July

- Changes from version 04:
  - Terminology changes to align with data plane alternatives draft.
  - Layering simplified to align with data plane alternatives draft.
  - Packet replication and elimination are an example of DetNet loss prevention, not the only possible approach.

Essential aspects of architecture

- **Reservation/enforcement:** Network resources are reserved and various forms of data plane queuing/shaping/scheduling are configured along a stream's path to ensure worst-case latency and zero congestion loss.
- **DetNet loss prevention:** Sequentialized streams can be sent over divergent explicitly routed paths and reassembled at various places. Network coding needs to be investigated.
- **Defense:** The effects of a misbehaving talker / bridge / router must be minimized.

Essential aspects of architecture

- One size does not fit all. Different applications and verticals make different selections of techniques.

- Reservation model includes Applications Controllers requesting QoS for streams from a Network Controller.

Open issues

- Which techniques for stream ID and sequencing for QoS and pinned-down paths are suitable in a mixed bridged and routed network? (But, see draft-dt-detnet-dp-alt.)

- Control plane has not been examined, much.

- Can DetNet help in wireless environments?

- Encoding methods (e.g. linear network encoding) need to be examined vs. replication and elimination.

Plans

- Shall draft-finn-architecture be adopted by the WG?

Open Discussion

- Blindfold? Cigarette? Ready! Aim!