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!