Transport Issues of Computing in the Network

https://www.ietf.org/id/draft-kunze-coinrg-transport-issues-01.txt

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Changes from 00 to 01

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Intention of the Draft: Raise Questions
**Advanced Transport Features – Retransmissions**

- **Who does the retransmission?**
  1. Sender
  2. Last successful position

- **How to deal with (changed) state in the intermediate nodes when packet is dropped later on the path?**
  - Do we want the notion of a transaction that should be revocable?

**LOOPS BOF** (Local Optimizations on Path Segments)
- Local packet loss recovery

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1. Retransmissions base on the end-to-end principle

- Sender retransmits if it has determined that receiver did not get original message
  - Sender and receiver act on knowledge that a packet is missing/a retransmission

- Should COIN elements have an understanding of retransmissions?
  - On the basis of existing transport mechanisms?

- How can COIN elements identify retransmissions?
  - Should there be dedicated signals for COIN elements (in COIN-capable transport?)?
Advanced Transport Features – Retransmissions

2. Retransmissions are sent out of order
   ▶ Should COIN elements be capable of incorporating retransmissions into their computation schemes?
     ■ Depending on flow granularity, contextual information might be necessary
   ▶ How can COIN elements find out that a packet is missing?
     ■ Computations might have to be delayed

3. Retransmissions are sent by sender/ can be requested by the receiver
   ▶ Should COIN elements be capable of requesting or performing retransmissions?
     ■ This could require holding (some) transport state
Advanced Transport Features

- Other features that cause similar questions of “who is in charge?”
  - Congestion control
  - Flow control
  - Flow ordering/Sequence numbers

- Different features impose different requirements

- Which set of transport features should be supported by COIN?
  - Depends on application …
Advanced Transport Features – Flow/Congestion Control

- **Mechanisms to avoid overloading**
  - the receiving host (flow control)
    - explicit end-host information
  - the network (congestion control)
    - volatile feedback from the network

- **COIN elements introduce loss, delay, …**
  - interpreted as network congestion and accounted for in congestion control
  - (Loss-based) Congestion control will repeatedly overload COIN element

- **Should COIN elements participate in end-to-end flow control?**
  - How? Dedicated resource constraint mechanism?
Plans

- **Transport Issues Draft**
  - Aspects/Questions that we’ve missed?
  - Clarification needed?

- **Industrial Use Cases Draft**
  - Hard to get “hard” numbers for the use cases
  - How to proceed?
    - Milestone for April 2020