Transport Issues of Computing in the Network

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

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More concise

Added Proof of Transit of SFC WG

Subsections & more details
for advanced transport features

Intention of the Draft: Raise Questions

Advanced Transport Features – Retransmissions
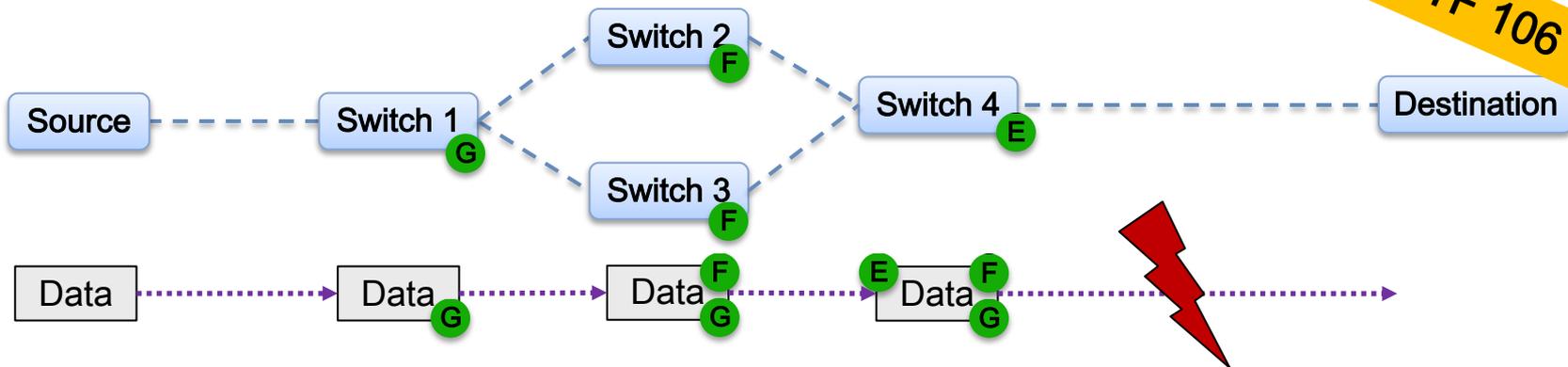
- **Who does the retransmission?**
  1. Sender
  2. Last successful position

- **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?)?

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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

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- **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 …

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- **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?

- **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