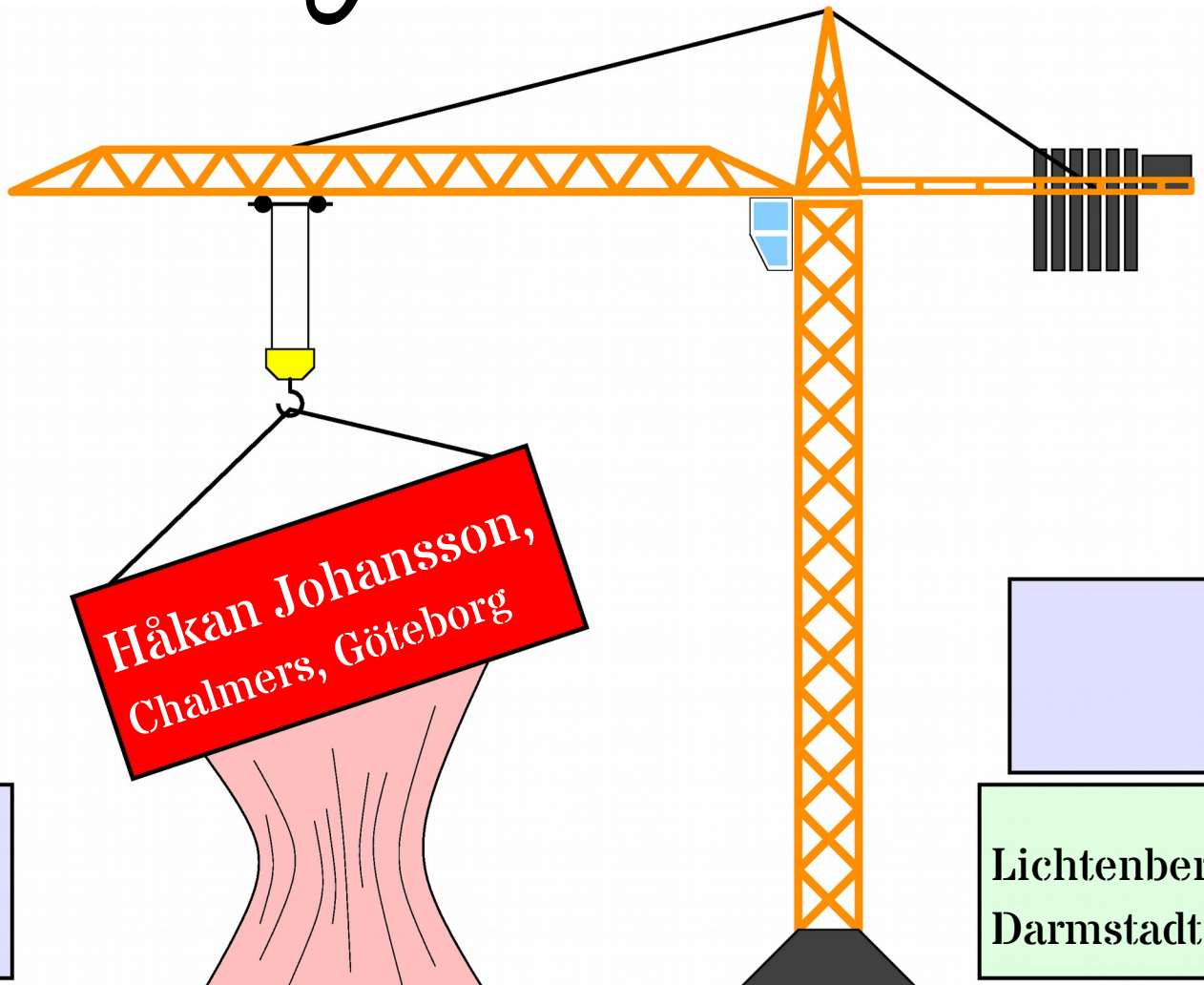
Mechanics of sticky events



Håkan Johansson,
Chalmers, Göteborg

Lichtenberghaus,
Darmstadt, April, 2017

Introduction

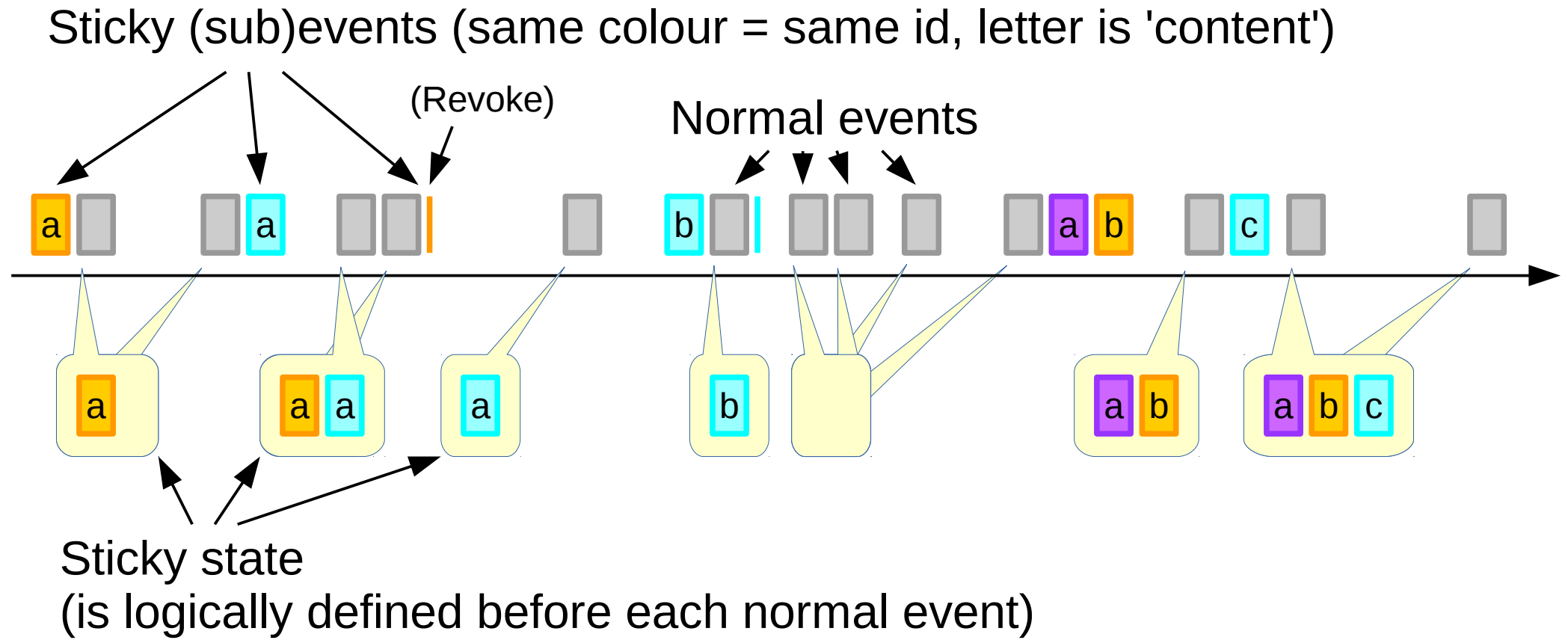
- Store slow-control information (HV settings, magnet currents...) in the data stream
  - Integrate with a distributed DAQ (NuSTAR).
  - Follow the DAQ topology.
- 'Normal' events not suitable:
  - Just flow through the DAQ / analysis.
  - Late connected clients / files would not get earlier set values.
- New concept: sticky events.
  - Delivered however late the connection is.

Sticky subevents

- Packaged in sticky events.
- The sticky thing is the subevents.
  - Sticky = held active until replaced.
- Sticky subevents identified (as usual) by
  - `type/subtype/ctrl/crate/procid`
- Removed as active with `length = -1`.

Sticky events: simple semantics

- Sticky subevents are valid until replaced
- … or revoked (replace by nothing)

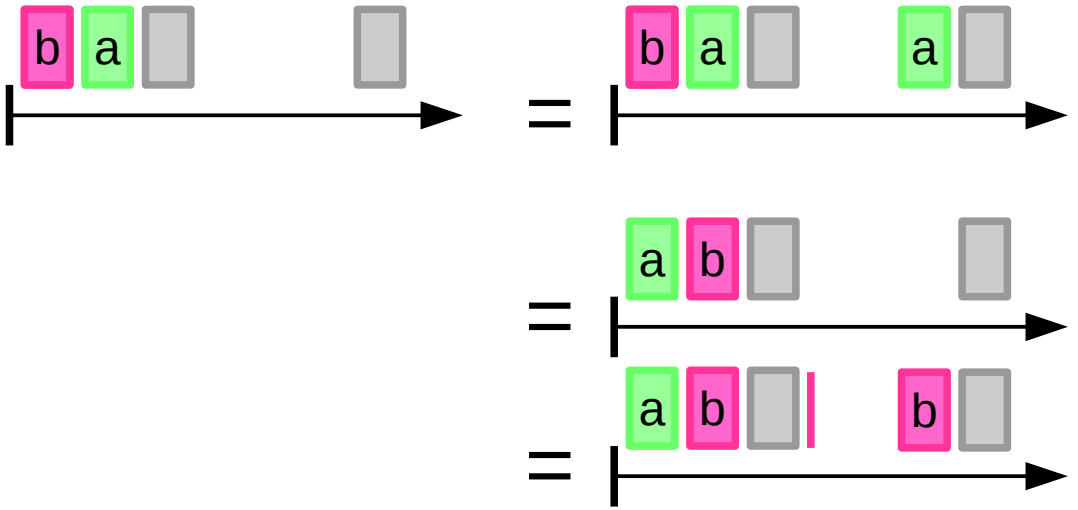


Guaranteed delivery

- An receiver (either file or network client) will **before** each normal event have received *exactly* the (at that point) active set of sticky subevents.

Sticky subevents may be delivered:

- Multiple times.
- In any order.

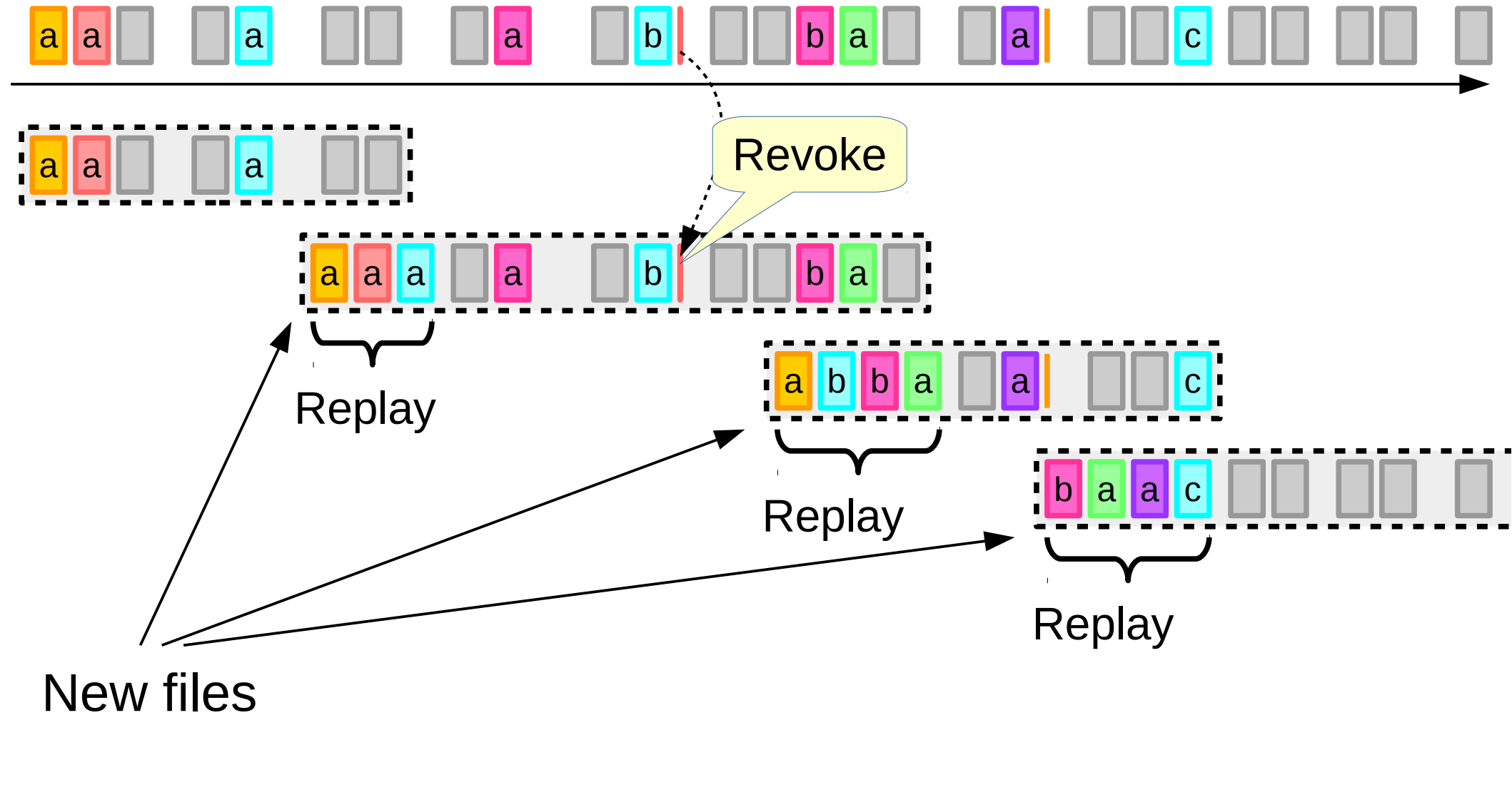


DAQ / proxy servers

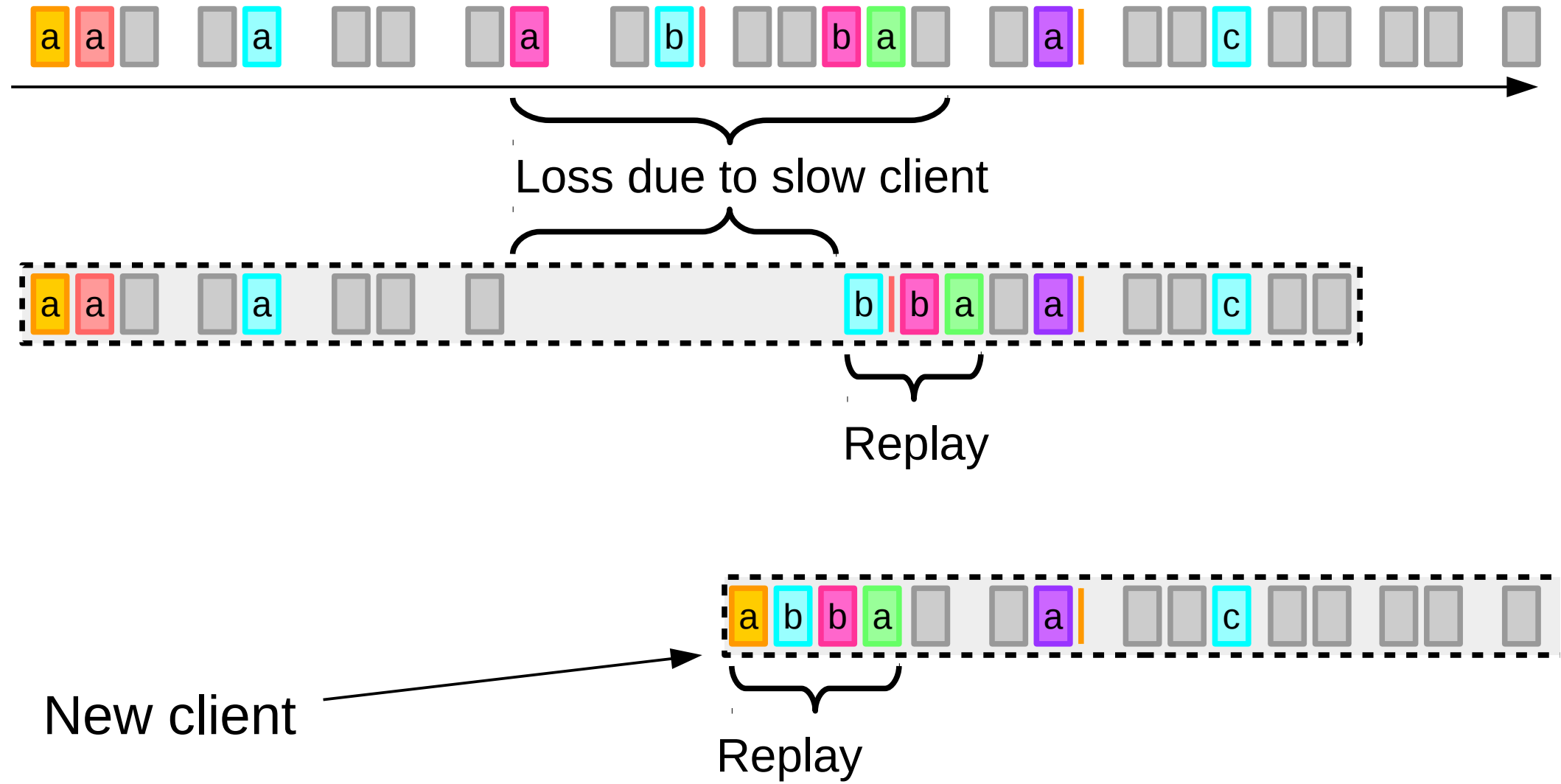
- Absorb the complications in standard programs.
- Keeps analysis clients simple.

Not so much a design choice,
rather a lucky side-effect.

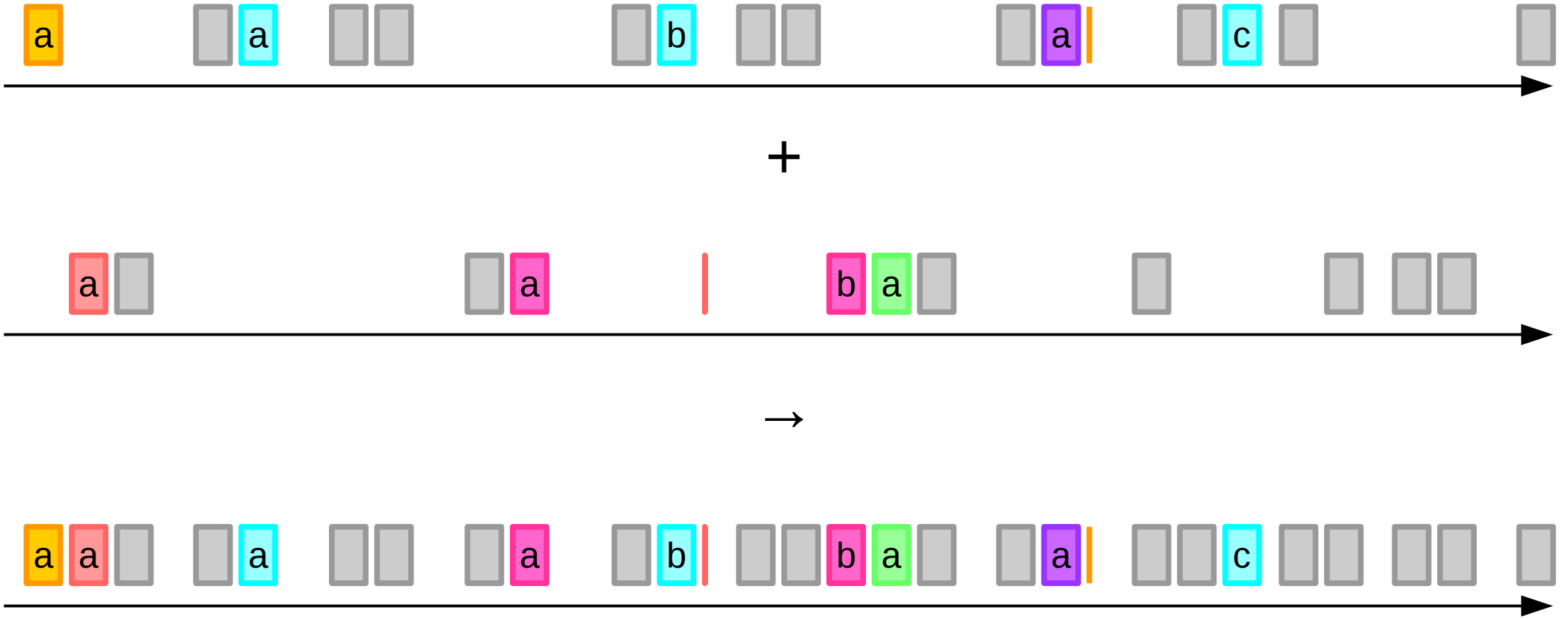
Output stages keep track



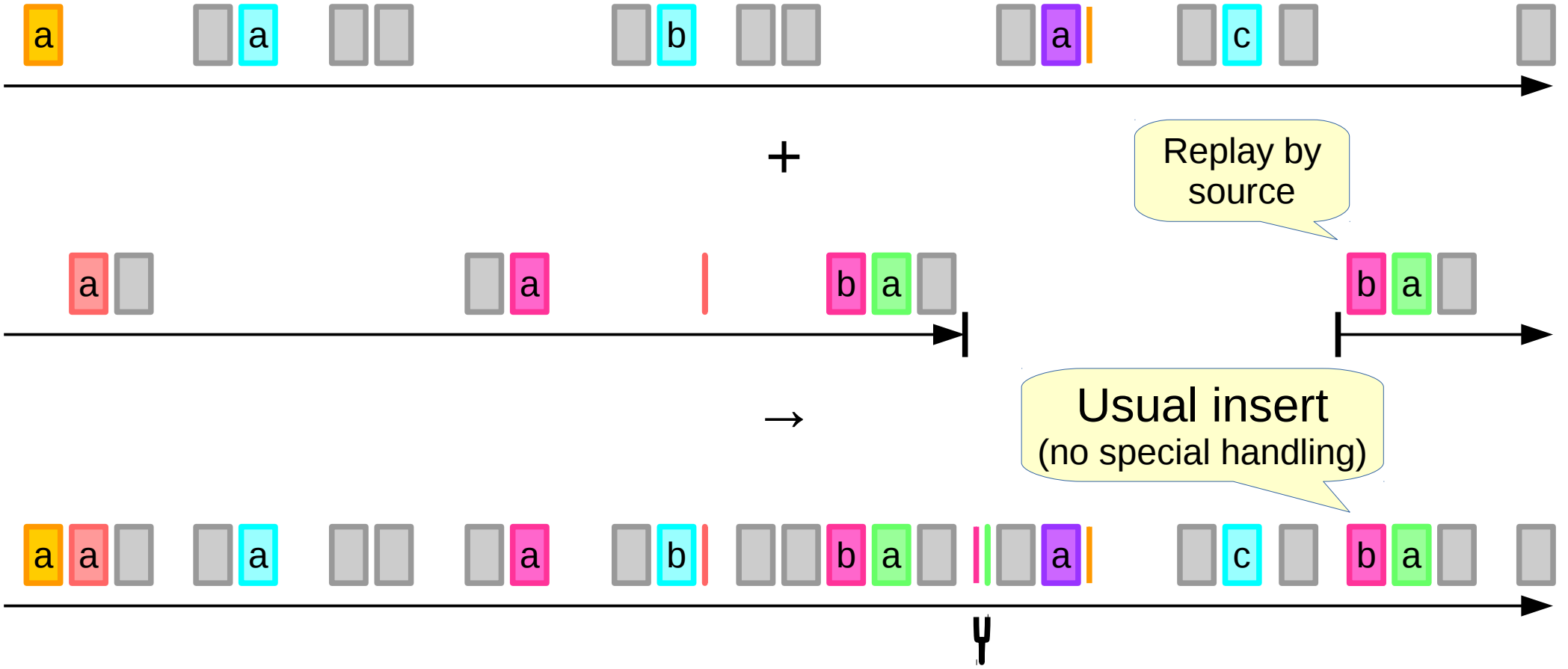
Output stages keep track (network)



Merging / time sorting

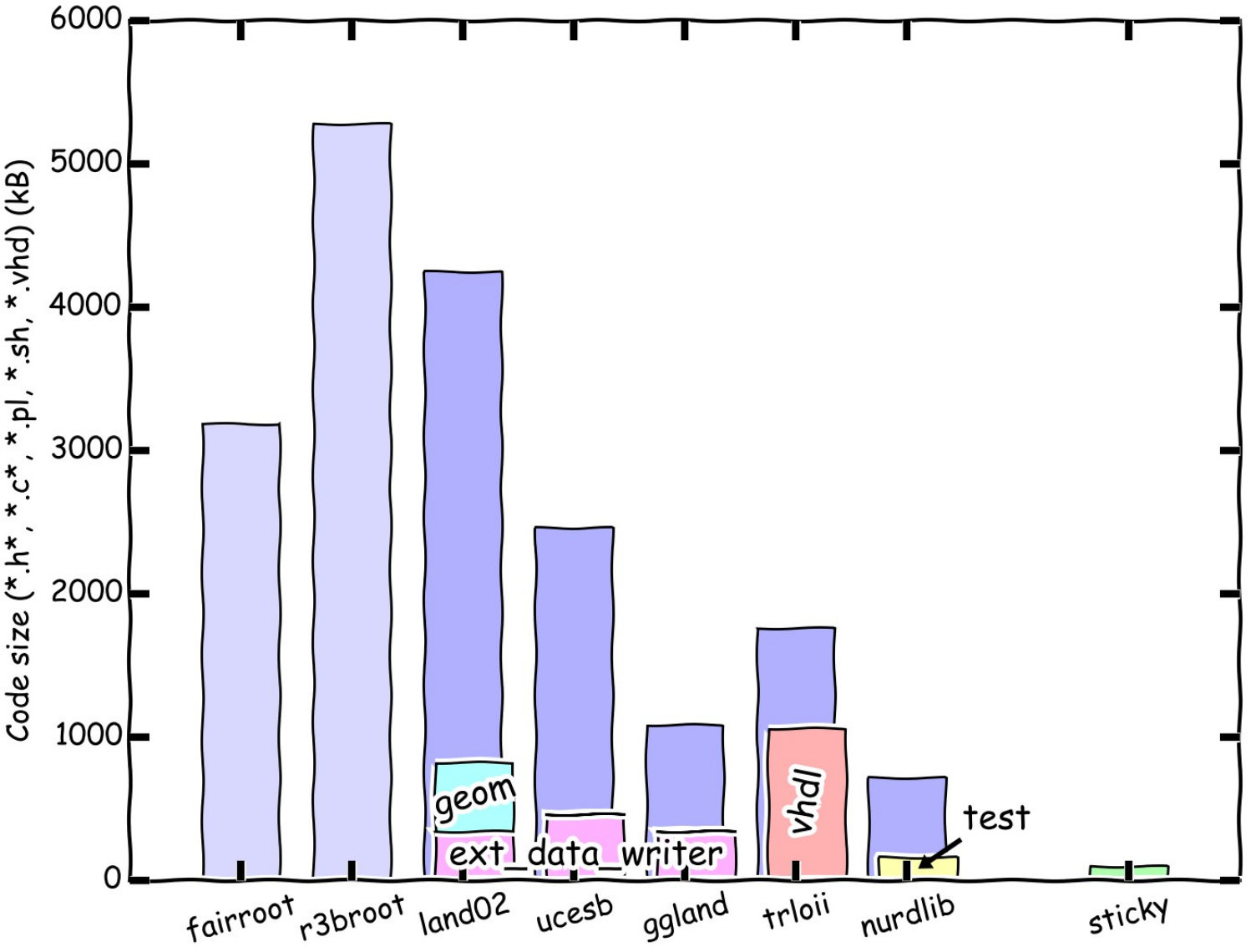


Merging – loss of source

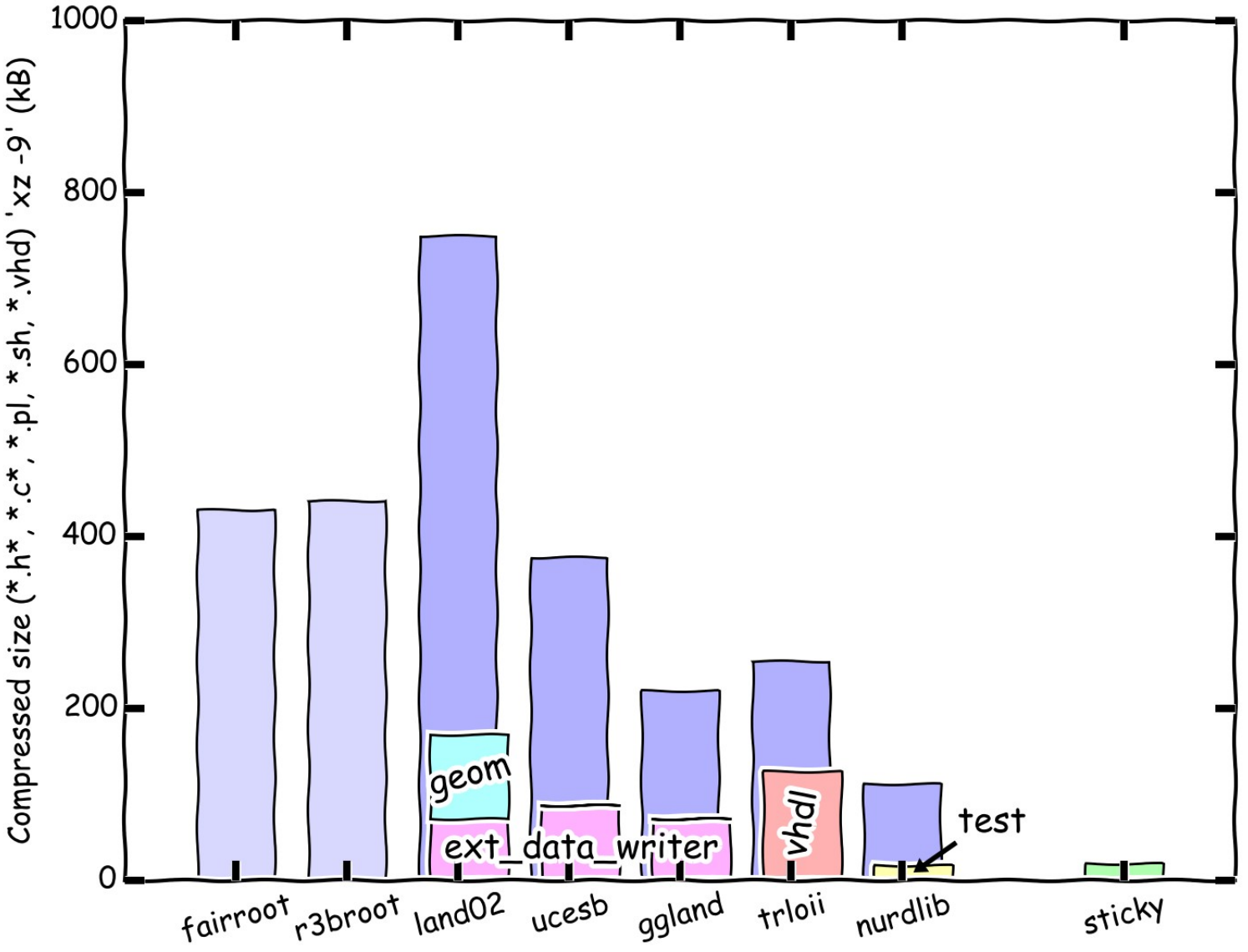


Revoke active sticky subevents that lost their source

Complicated?



Complicated? (comparing compressed)



Short-range ”time-machine”

- Set-values are stored with change timestamp
- Measured values are only known good after each measurement period, but needed by analysis before the period.

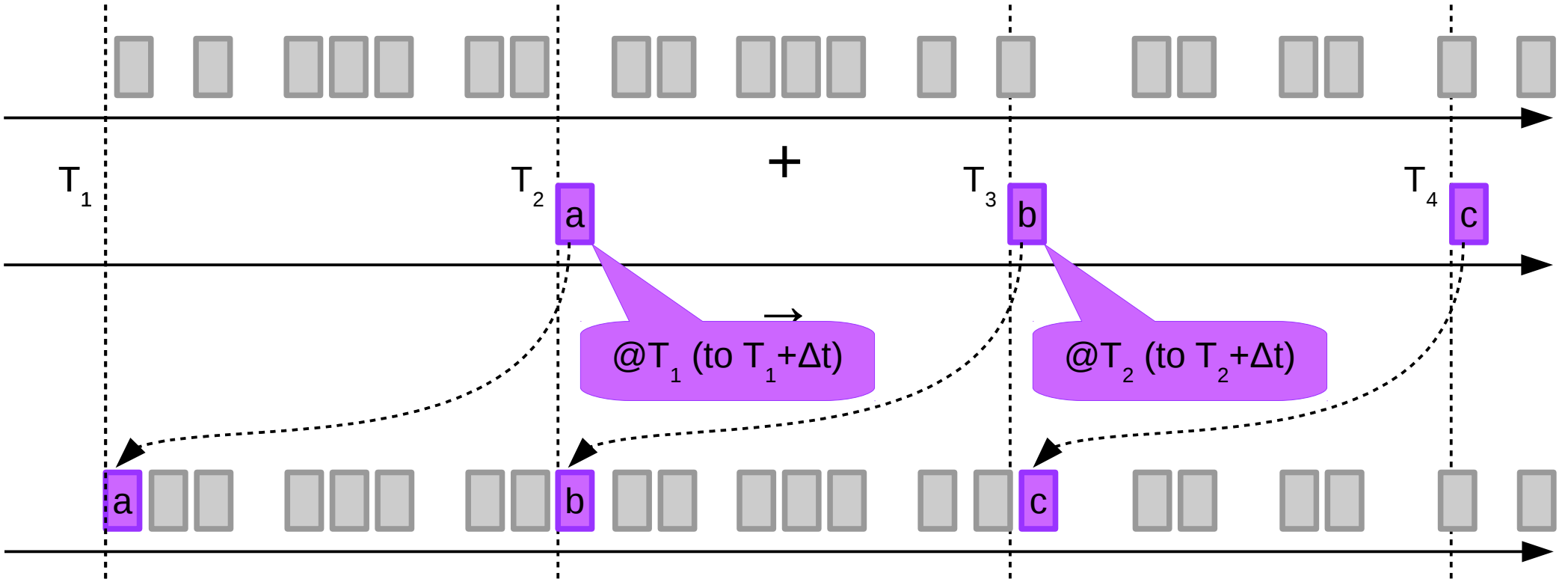
  → Use time sorter!

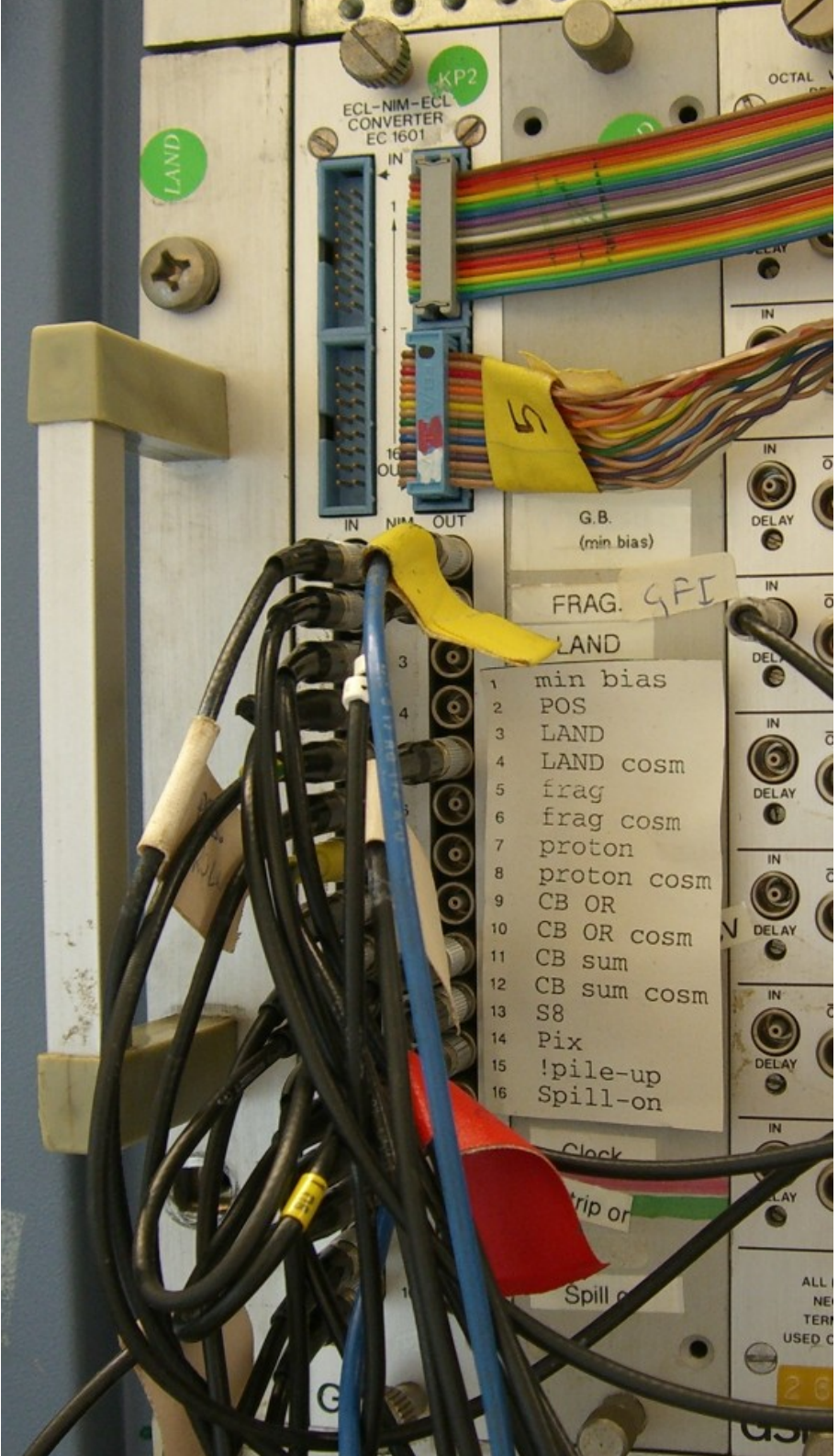
  - Measure during interval [T,T+Δt]
  - Record at time T+Δt
  - Time-stamp as time T

Short-range ”time-machine” II

→ Use time sorter!

- Measure during interval [T,T+Δt]
- Record at time T+Δt
- Time-stamp as time T





Finale!

Thank you!

Lots of FUN !