Efficient (re)naming in Conflict-free Replicated Data types (CRDTs)
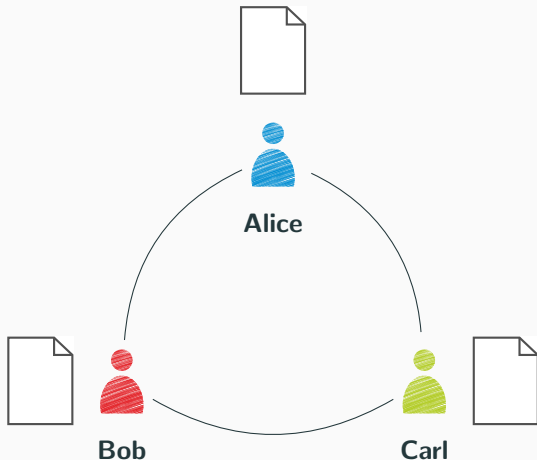
Matthieu Nicolas

November 28, 2017
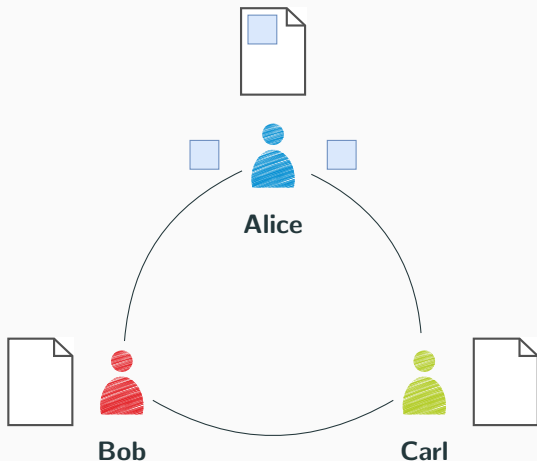
University of Lorraine | *Inria* COAST team
Supervised by Gérald Oster and Olivier Perrin

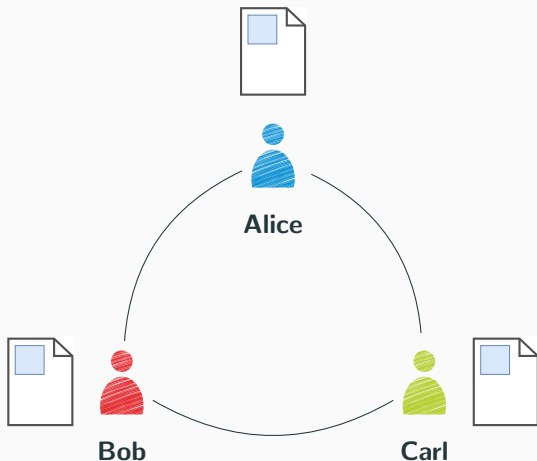# Conflict-free Replicated Data types (CRDTs)

- Replicated data structure

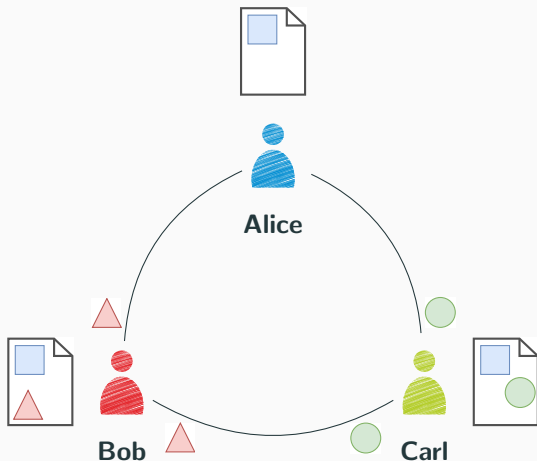# Conflict-free Replicated Data types (CRDTs)

- Replicated data structure
- Updates performed without coordination

Conflict-free Replicated Data types (CRDTs)
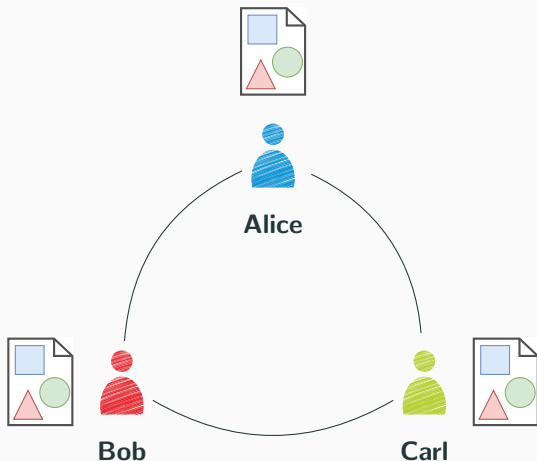

- Replicated data structure
- Updates performed without coordination
- Eventual consistency

Conflict-free Replicated Data types (CRDTs)

- Replicated data structure
- Updates performed without coordination
- Eventual consistency

Conflict-free Replicated Data types (CRDTs)

- Replicated data structure
- Updates performed without coordination
- Eventual consistency

Identifier-based CRDTs

Identifiers

- Attached to elements to handle concurrent updates
- Have to comply to several constraints

Identifier-based CRDTs

Identifiers

- Attached to elements to handle concurrent updates
- Have to comply to several constraints
  - Order relation

Identifier-based CRDTs

Identifiers

- Attached to elements to handle concurrent updates
- Have to comply to several constraints
    - Order relation
    - Causality relation

Identifier-based CRDTs

Identifiers

- Attached to elements to handle concurrent updates
- Have to comply to several constraints
    - Order relation
    - Causality relation
    - ...

Identifier-based CRDTs

Identifiers

- Attached to elements to handle concurrent updates
- Have to comply to several constraints
    - Order relation
    - Causality relation
    - ...

Limits

- Unbounded size of identifiers
- Efficiency decreasing over time

Can we propose

- more efficient identifiers given several constraints ?
- mechanisms to rename identifiers ?

Next step

- Build taxonomy of constraints on identifiers and of current solutions

Thanks for your attention, any questions?

References i

6