

Efficient (re)naming in Conflict-free Replicated Data Types (CRDTs)

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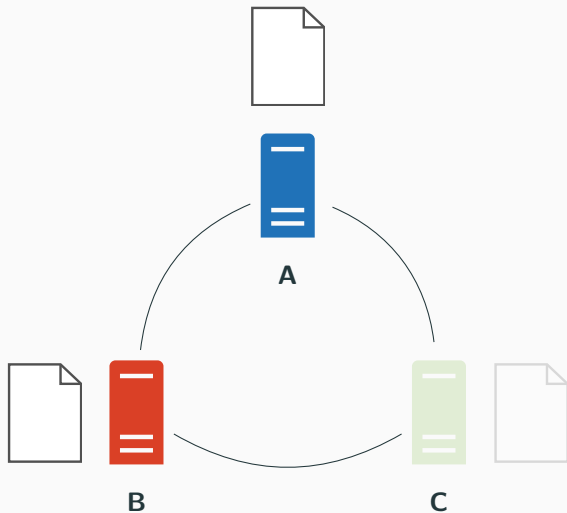
COAST team

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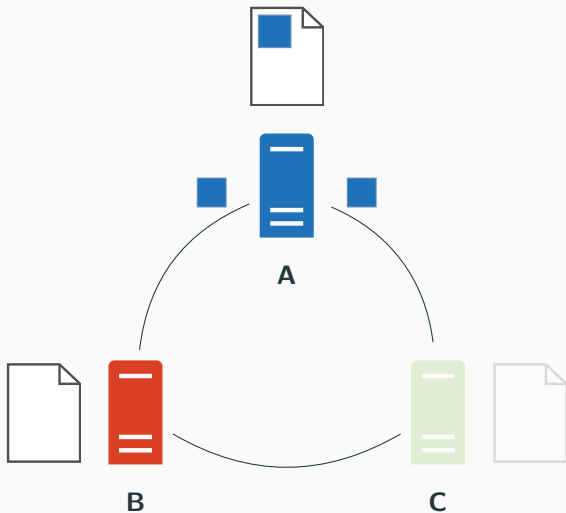


Conflict-free Replicated Data Types (CRDTs)[2]



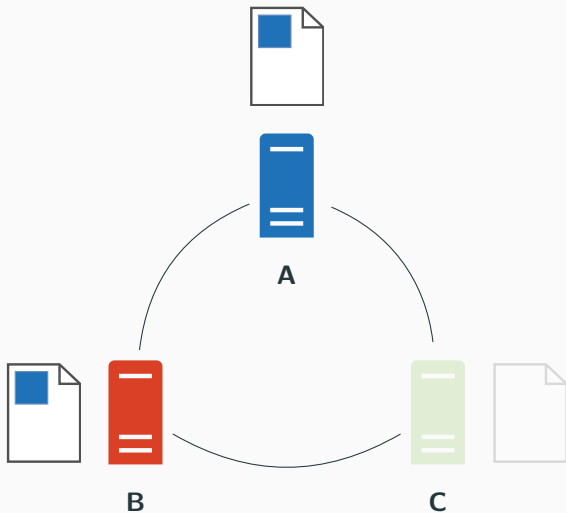
- Replicated data structure

Conflict-free Replicated Data Types (CRDTs)[2]



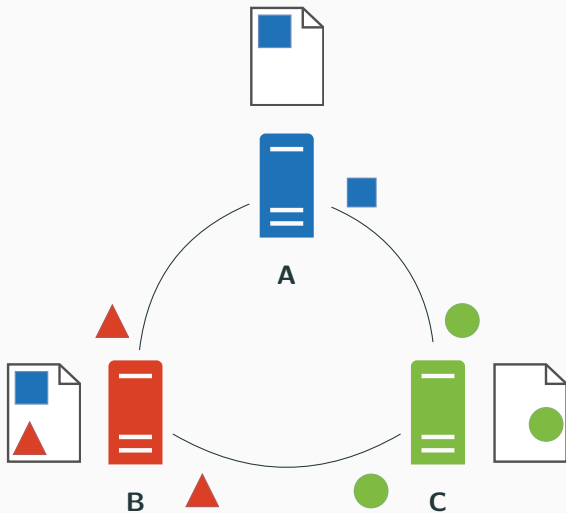
- Replicated data structure
- Updates performed without coordination

Conflict-free Replicated Data Types (CRDTs)[2]



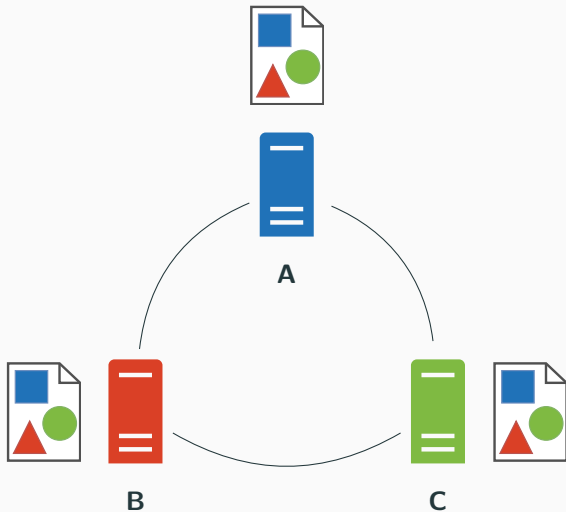
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Conflict-free Replicated Data Types (CRDTs)[2]



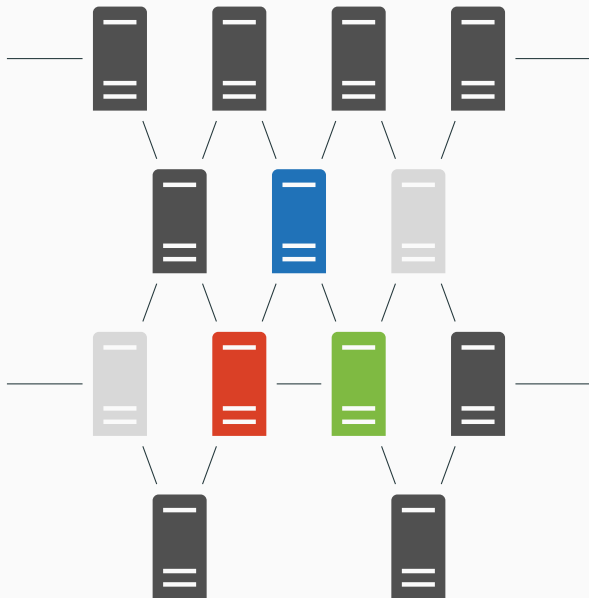
- Replicated data structure
- Updates performed without coordination

Conflict-free Replicated Data Types (CRDTs)[2]



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

Large-scale system



Identifier-based CRDTs

Identifiers

- Attached to elements or updates
- Have to comply to several constraints
 - Unique
 - Immutable
 - Order relation
 - Many others
- Achieve transaction-less and commutative updates

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Limits

- Unbounded size of identifiers
- Efficiency decreasing over time

Reduce size of identifiers

- Renaming problem[1]

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Make identifiers mutable again

- Trade-off mutability/immutability

Thanks for your attention, any questions?





D. Alistarh, J. Aspnes, S. Gilbert, and R. Guerraoui.

The complexity of renaming.

In *Fifty-Second Annual IEEE Symposium on Foundations of Computer Science*, pages 718–727, Oct. 2011.



M. Shapiro, N. Preguiça, C. Baquero, and M. Zawirski.

Conflict-free Replicated Data Types.

In *International Symposium on Stabilization, Safety, and Security of Distributed Systems - SSS 2011*, pages 386–400, Grenoble, France, Oct. 2011. Springer.