Operation-based CRDTs

Concurrent operations are commutative **but not necessarily idempotent.**

We need to keep that in mind when choosing the transport protocol in a real distributed system

Operation-based CRDTs

Concurrent operations are commutative
but not necessarily idempotent.

We need to keep that in mind when choosing the transport protocol in a real distributed system

Operation-based CRDTs
From a programmer's perspective

```haskell
-- | An effector applies an operation on a state to produce a new state
class Effector t op | t → op where
  applyOperation :: op → t → t


-- | A generator is a way of expressing state modifications
-- | as  operations that can be sent over the network
class Generator t op | t → op where
  generateOperations :: t → t → Array op
```

```
|\_/|
|     |
| @ @   Woof!
|     |
|  ◇
|   _/_____ ___ ((| |))
|              |    `--'|
_|_____|   |_.'
/_/_____/___/___|
```