CL-FACTS

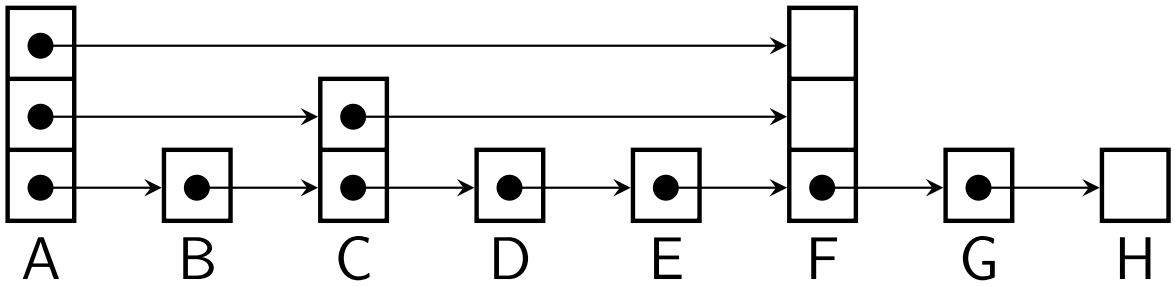
Thomas de Grivel <thomasdegrivel@gmail.com>

ELS 2017

2017-04-03

Unlabelled Skip Lists

- **Skip Lists** : fast, better parallelization than trees.
  - Probabillistic data structure.
  - Search, insert, delete : $O(log\ n)$.
  - Single link updates are atomic, no locking needed.



- **Only values**, no keys. Content addressed memory.

Triple store

- **Store** as much data as you want as **triples** $\{Subject, Predicate, Object\}$.
- Three **sorted indexes** : $\{S, P, O\}$, $\{P, O, S\}$, $\{O, S, P\}$.
- **Iterate** on queries with [0..3] unknown ?values (sic).

FACTS :WITH

```
(defun movies-from-director (movie)
  (let ((other-movies))
    (facts:with ((?director :directed movie
                            :directed ?other-movie))
      (push ?other-movie other-movies))
    other-movies))
```

Transactions

- All operations on database are **logged to a file**.
- Transactions can be aborted with defined **rollback functions**.
- **Persistence** : at startup the log is replayed and the database dumped.

Future

- **Disk storage**, for now all data is in-memory.
- **Computed facts** inferred from added facts.
- **Events** with pattern matching on inserts and deletes.
- User defined **indexes** for arbitrarily complex patterns.
- RDF, turtle...

Links

- **Facts**

  https://github.com/thodg/facts

- **Unlabelled Skip List**

  https://github.com/thodg/facts/blob/master/usl.lisp

- **Indexes**

  https://github.com/thodg/facts/blob/master/index.lisp

- **Rollback**

  https://github.com/thodg/rollback