

ON "LOCAL-FIRST"

Beyond the CRDT silver bullet

PART 1

EXPOSITION

TARGET

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- documents
- files
- personal data repositories

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Not: banking services, e-commerce, social networking,
ride-sharing, etc.

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7 IDEALS FOR LOCAL-FIRST SOFTWARE

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1 – NO SPINNERS: YOUR WORK AT YOUR FINGERTIPS

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**2 – YOUR WORK IS NOT
TRAPPED ON ONE DEVICE**

...

3 – THE NETWORK IS OPTIONAL

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4 – SEAMLESS COLLABORATION WITH YOUR COLLEAGUES

...

5 – THE LONG NOW

...

6 – SECURITY AND PRIVACY BY DEFAULT

...

7 – YOU RETAIN ULTIMATE OWNERSHIP AND CONTROL

TOWARDS A BETTER FUTURE

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CRDTs (Conflict-free Replicated Data Types) as a Foundational Technology

USE CASE

```
# in node A and node B  
s = "Hello, World"  
  
# in node A  
s = "Hello, Alice"  
  
# in node B  
s = "Hello, Bob"
```

How to reconcile those?

- Hello, ABloibce
- Hello, AliceBob
- Hello, BobAlice
- Hello, Alice

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EXISTING CRDTS DIFFER

- performance
- storage
- compression
- metadata overhead

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**HINT TOWARDS THE
"AUTOMERGE" CRDT**

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@show comparison table, page 9

PART 2

CRITIQUE

SOFTWARE LICENSE

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@ "In our opinion, maintaining control and ownership of data does not mean that the software must necessarily be open source."

EXAMPLE 1 – INTENTIONAL RESTRICTION

```
#!/bin/sh
TODAY="$(date +%s)"
LICENSE_EXPIRATION="$(date -d 2020-10-27 +%s)"
if [ "$TODAY" -ge "$LICENSE_EXPIRATION" ]; then
    echo 'License expired!'
    exit 1
fi
echo $((2 + 2))
```

```
# today
$ ./useful-adder.sh
4

# tomorrow
$ ./useful-adder.sh
License expired!
```

EXAMPLE 2 – UNINTENTIONAL RESTRICTION

```
# today
$ useful-program
# ... useful output ...

# tomorrow, with more data
$ useful-program
ERROR: Panic!  Stack overflow!
```

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LOCAL-FIRST **REQUIRES FREE SOFTWARE**

Otherwise "The Long Now" (ideal nº5) is lost

DENIAL OF EXISTING SOLUTIONS

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@ "In principle it is possible to collaborate without a repository service, e.g. by sending patch files by email, but the majority of Git users rely on GitHub."

Solution: either GitHub+CRDTs or git send-email

PLAIN-TEXT FORMATS

@ "Git is highly optimized for code and similar line-based text file"

It even pulls software to the plain text direction, e.g.:

- * delivery-templates
- * common-core.protocols.config

Why not exploit that more?

DITCHING OF WEB APPLICATIONS

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@ "The architecture of web apps remains fundamentally server-centric
Disagree. Contrast PouchDB with Android Instant Apps

COSTS ARE UNDERRATED

- storage
- backups
- maintenance

Example: blog vs vlog

REAL-TIME COLLABORATION A BIT OVERRATED

It is only possible on the presence of reliable,
medium-quality network connection

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@X also works when inside an elevator,
subway or plane!"

ON CRDTS AND DEVELOPER EXPERIENCE

@ "For an app developer, how does the use of a CRDT-based data layer compare to existing storage layers like a SQL database, a filesystem, or CoreData? Is a distributed system harder to write software for?

YES.

See "A Note on Distributed Computing"

CONCLUSION

Why this is a "paper I love": it took offline—first and ran with it.

But a pinch of CRDT won't make the world local—first. The tricky part is the end of the sentence: "in spite of the Cloud".

REFERENCES

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