

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

...

2 – your work is not trapped
on one device

...

3 – the network is optional

...

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

Existing CRDTs differ

- performance
- storage
- compression
- metadata overhead

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nt towards the "automerge" CRD

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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
```

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 nÂ°5) 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

1. "Local-First Software: You Own Your Data, in spite of the Cloud", by M. Kleppmann, A. Wiggins, P. Van Hardenberg and M. F. McGranaghan
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