

Coherence

conflict-free* DVCS
for the future

(P) VCS:



git



hg



svn

Resolving
conflicts

Resolving
conflicts
SUCKS

does it have to be
that way?

does it have to be
that way?

(NO)



Google Docs



==

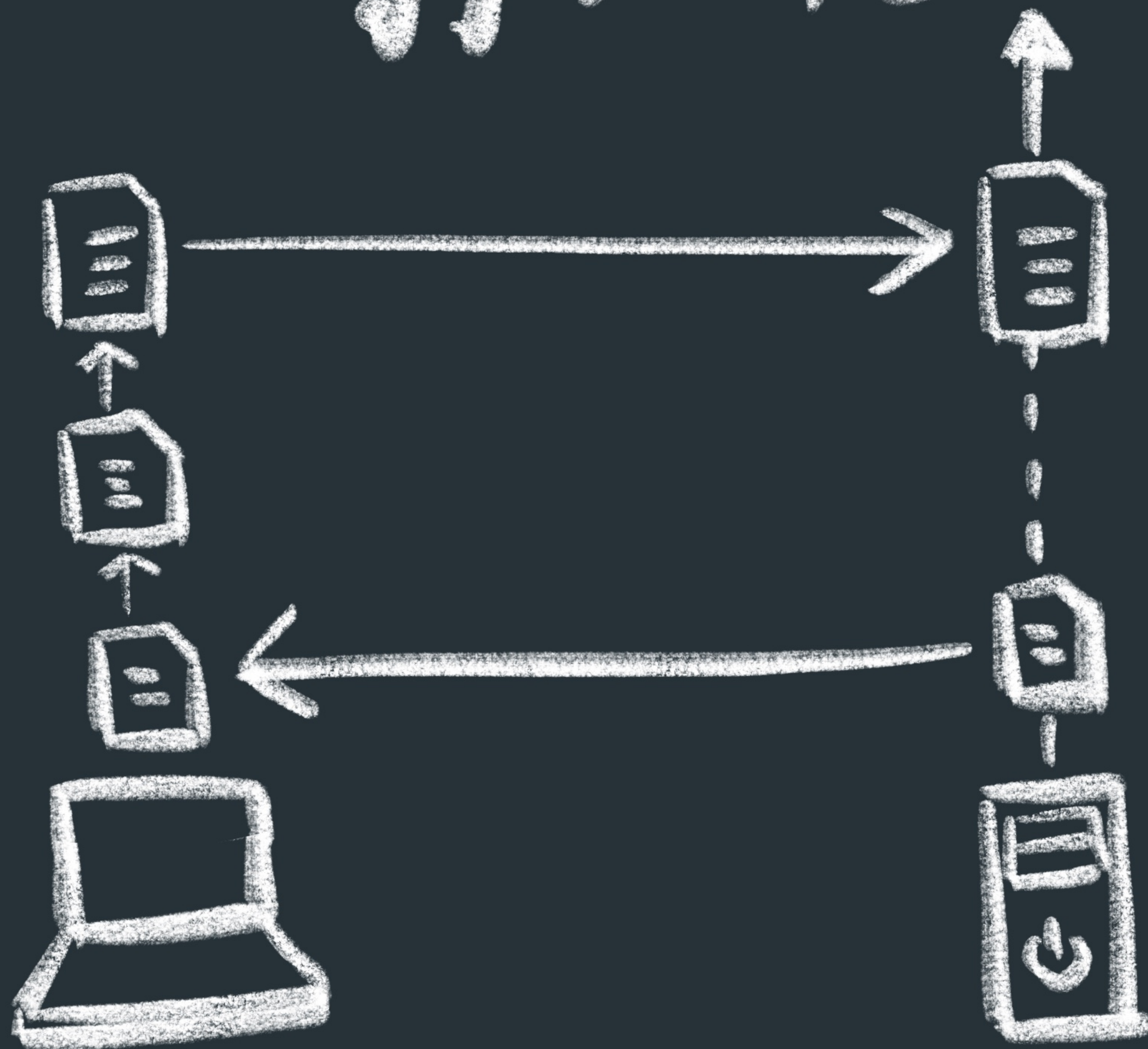
Google Docs

NO

*****ng

merging

offline*



OT

operational transformation

—
—
—
—
— I —

_____ abcI—

_____abcI_____

{at: 772,
len: 3}

{at: 10, len: 1}

— SI —

—

—

—

— abc I —

—

{at: 772,
len: 3}

{at: 10, len: 1}

— SI —

—

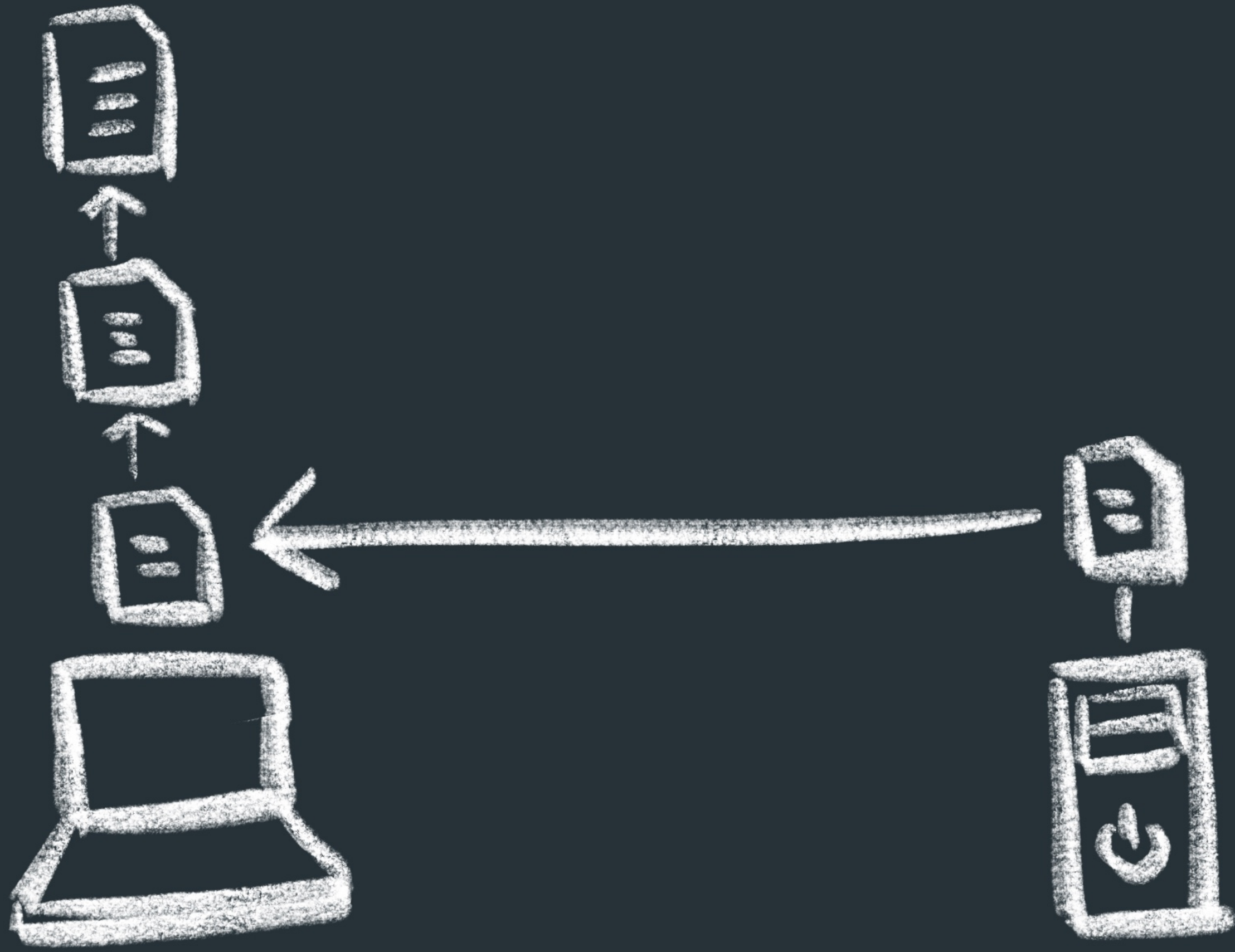
—

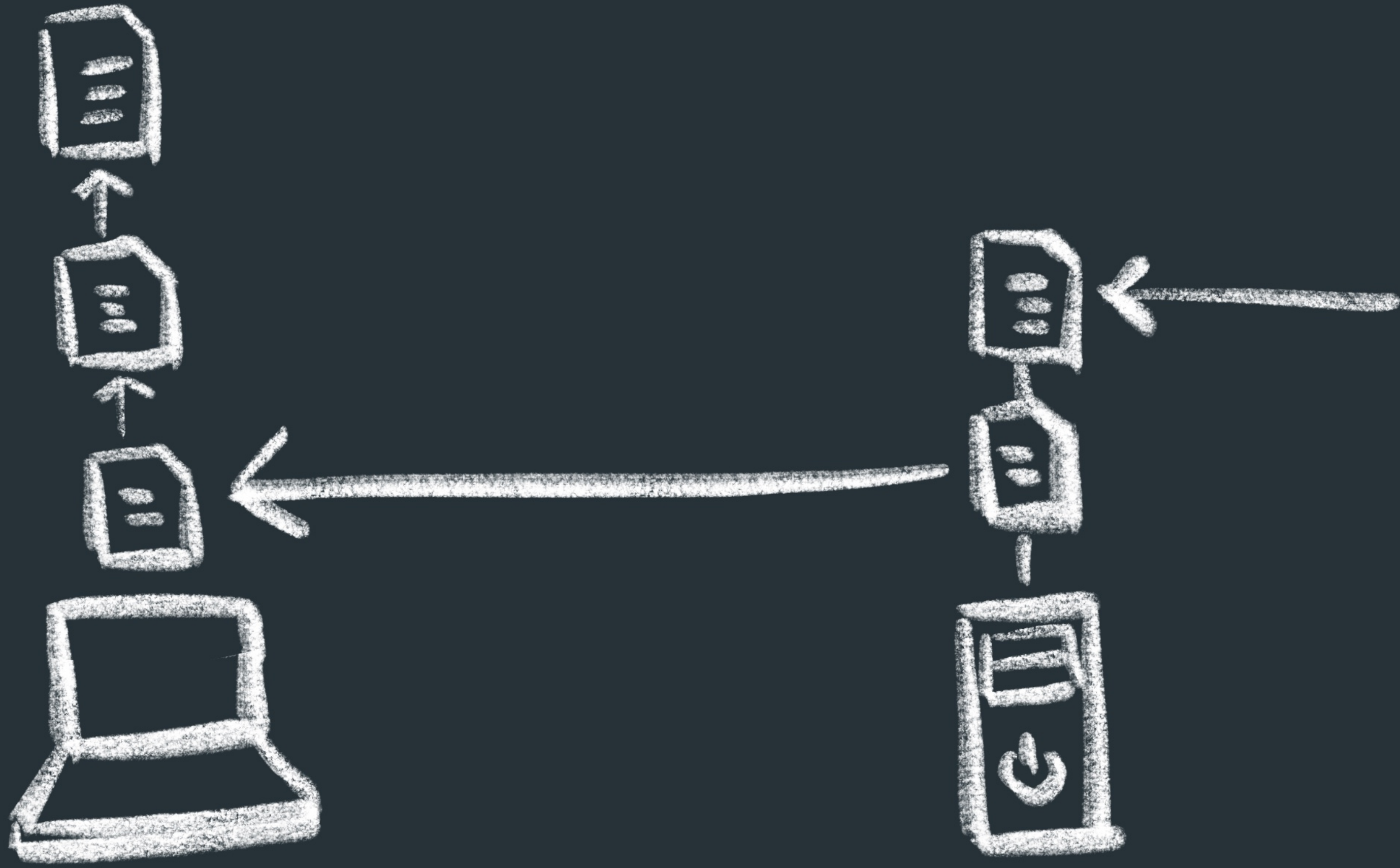
—

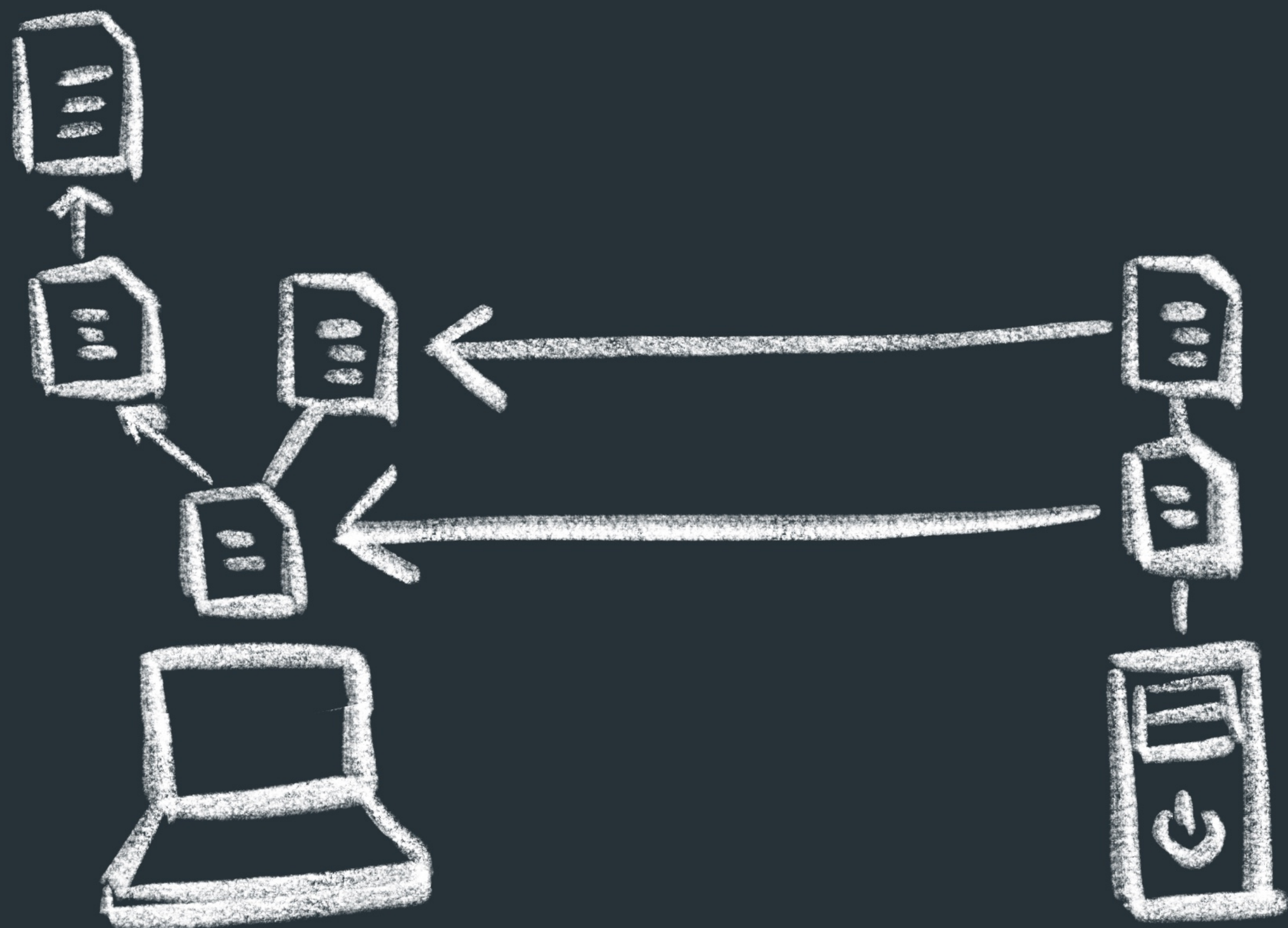
— abc I —

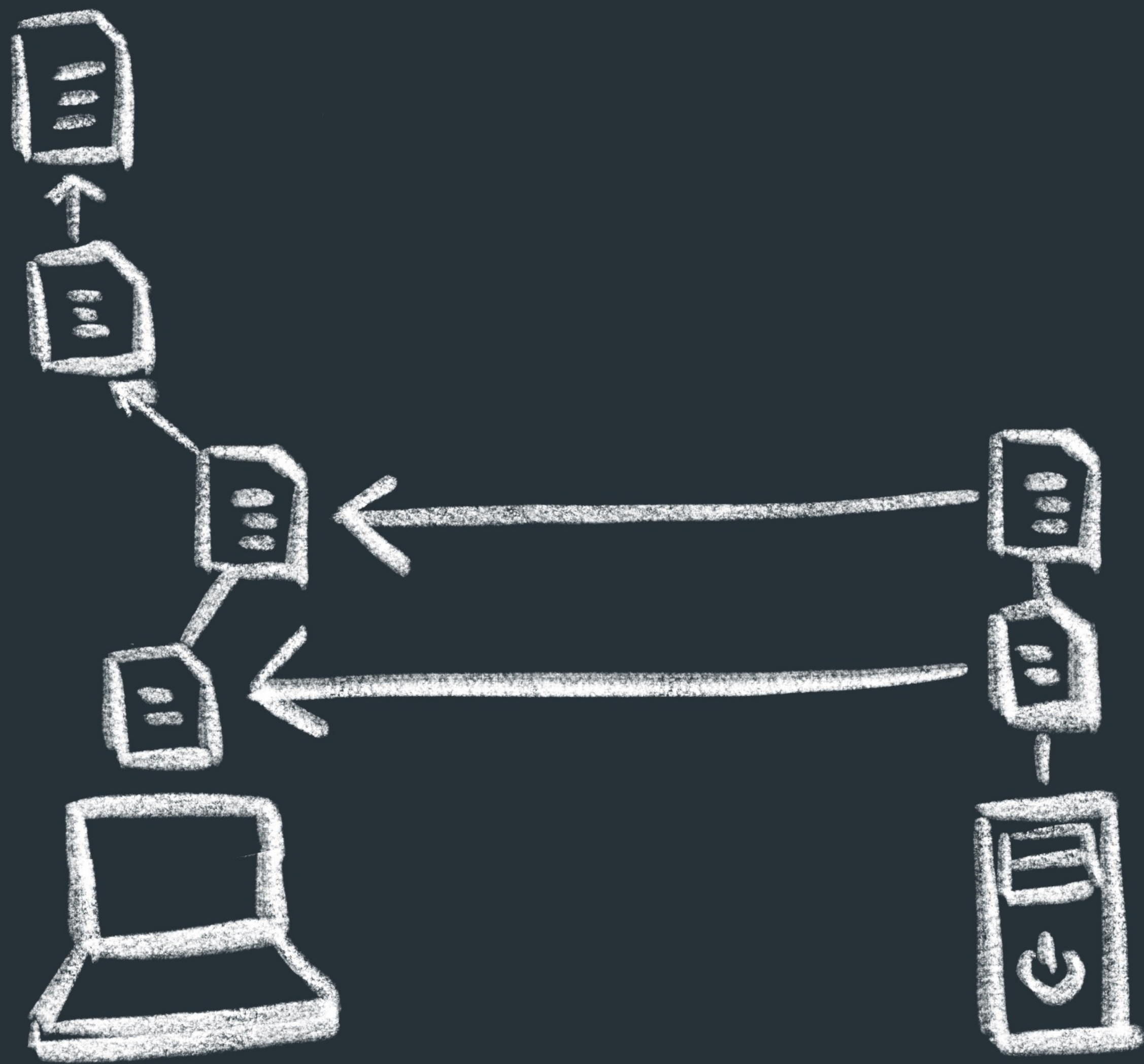
—

{at: ~~772~~, 773
len: 3}

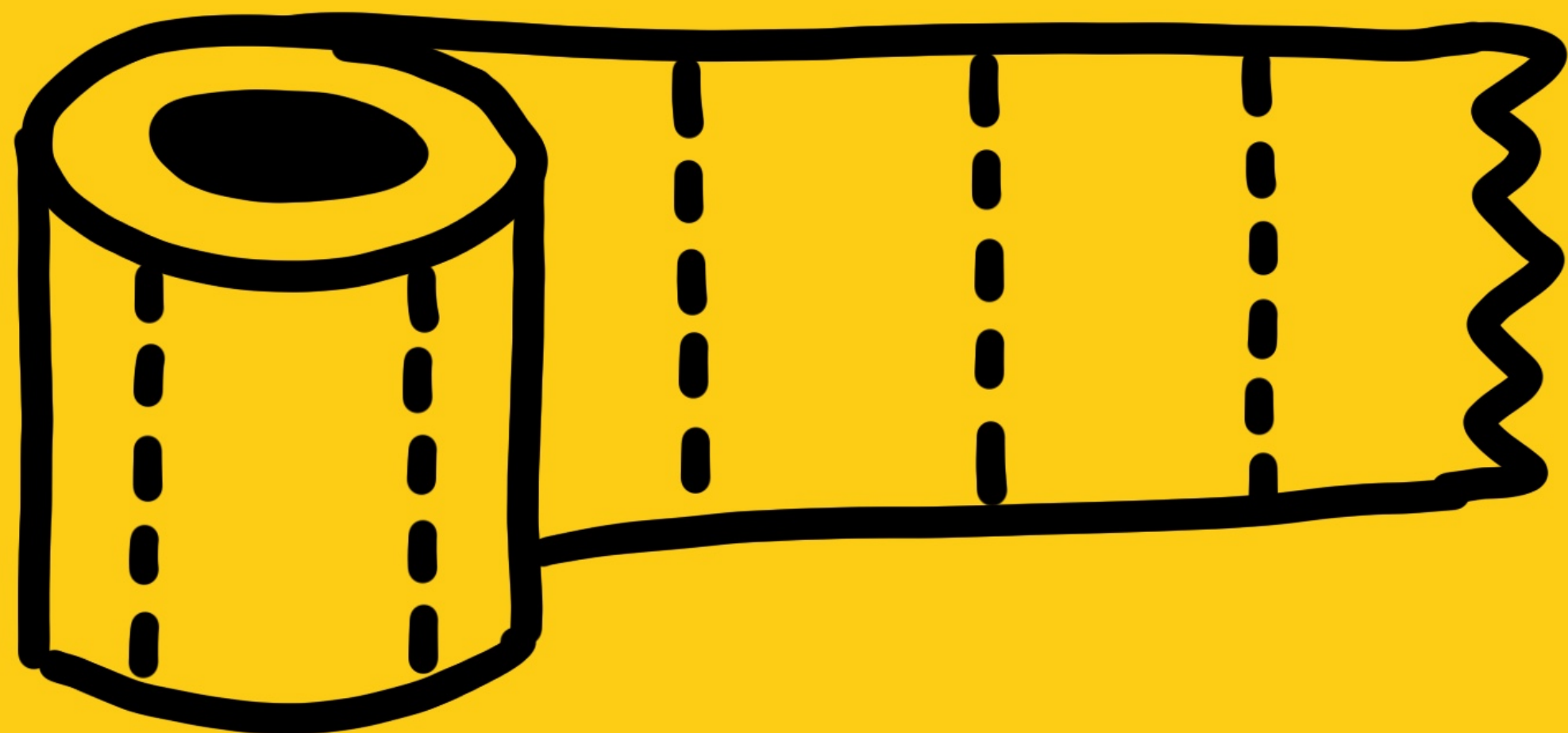




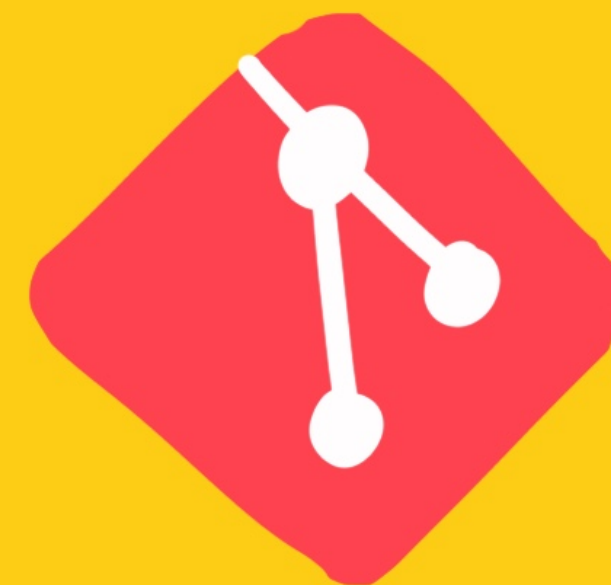




OT



git



?



Replicated Growable
Array

RGa

a CRDT instance

horse

unique id

horse

<sequence #,
client id>

1 2 3 4 5

horse



< 2,
"tnsk" >

1 2 6 3 4 5

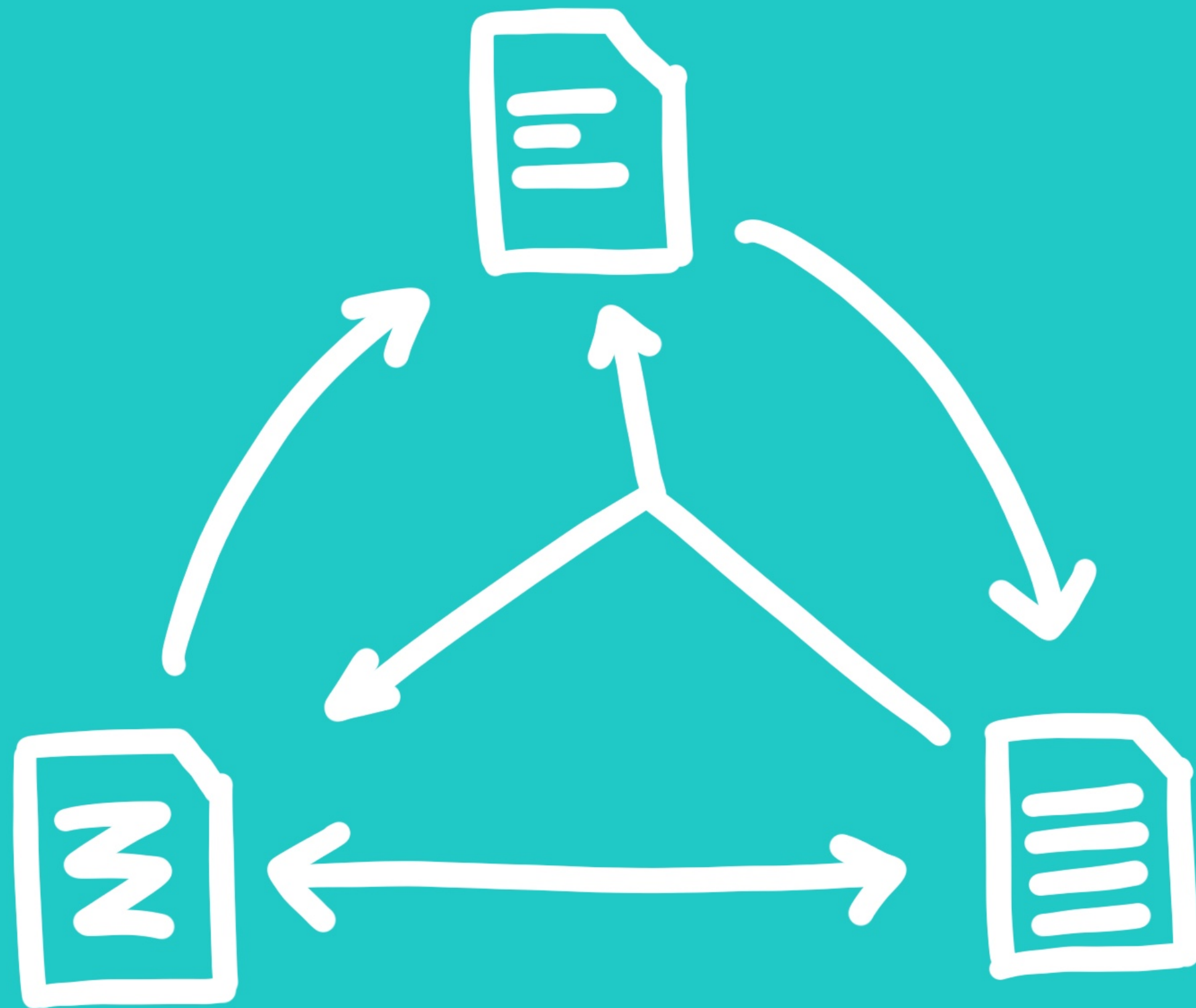
h~~o~~oIrase

<sequence #,
client id,
tombstone>

{ op: insert,
text: [<"0", 6, "tnsk">]
after: <"0", 2, "tnsk"> }

1 2 6 3 4 5

h~~o~~oI rse



**powered by CRDT*

COHERENCE ==

SYNC PROTOCOL

+

STORAGE

+

RGA

+

EDITOR PLUGIN

Text+meta

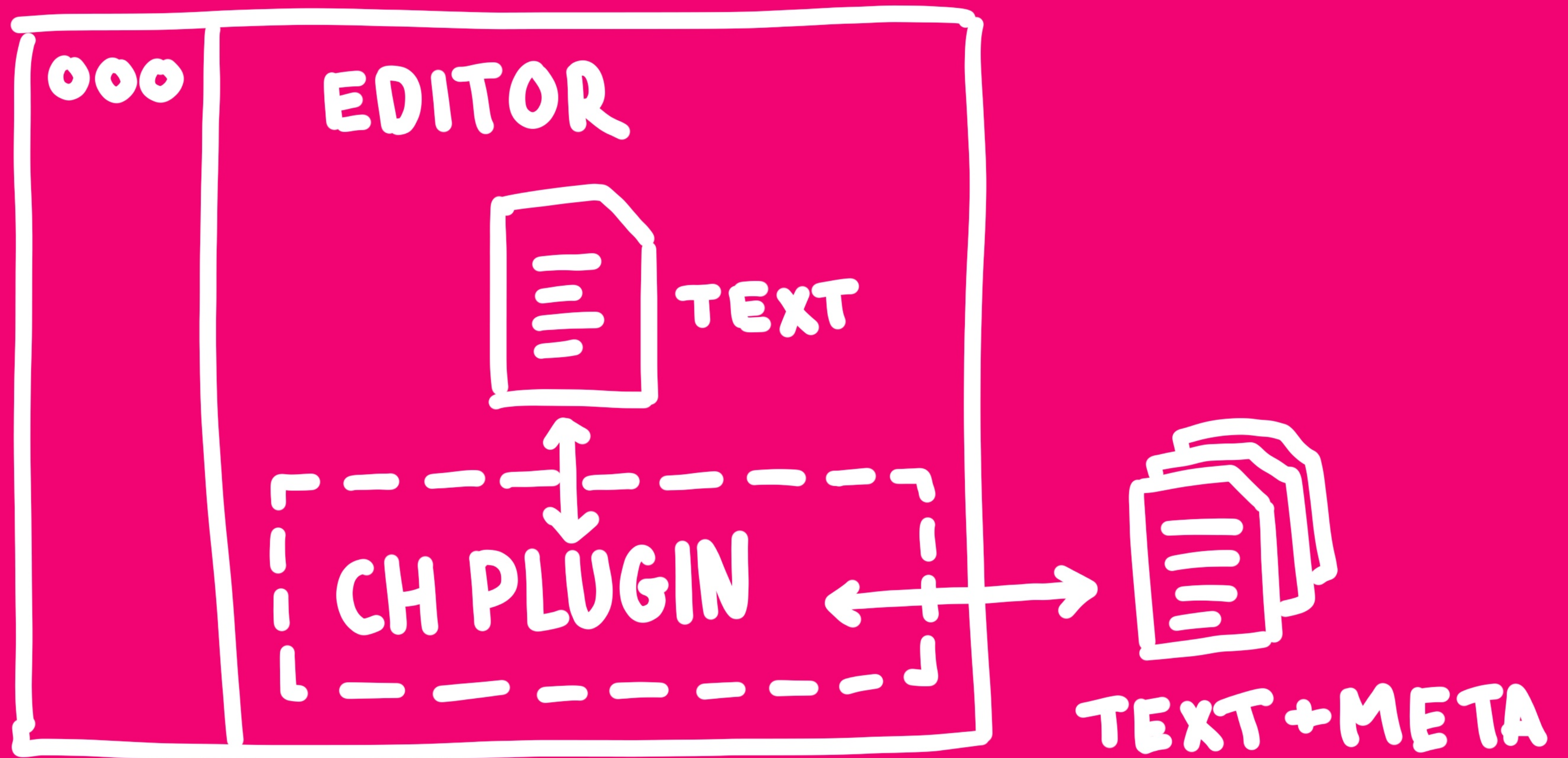
UTF-16	char	x6 overhead
64 bit	seq#	
32 bit	author	

full document history

per-character replay

per-character blame

Automatic Conflict Resolution



COHERENCE

problems?

1. It doesn't exist

1. It doesn't exist

$\neg(\neg)$

2. SEMANTIC CONFLICTS

resolved $\neq$ intent kept

HEADER

I

HEADER

I

HEADER

DogeI

HEADER

CoinI

HEADER

Doge Coin |

HEADER

Doge Coin |

HEADER

Doge
Coin|

HEADER

Doge
Coin|

```
function f(){  
}
```

```
function g(){  
  body  
}
```

```
function f(){  
}
```

```
function g(){  
  body  
}
```



```
function f(){  
}
```

```
function g(){  
  new body  
}
```

```
function f(){  
  body  
}
```

```
function g(){  
}
```



```
function f(){
```

body

```
}
```

```
function g(){
```

new body

```
}
```

```
function f(){
```

body

```
}
```

```
function g(){
```

new body

```
}
```

```
function f(){  
  new body  
}
```

```
function g(){  
  
}
```

```
function f(){  
  new body  
}
```

```
function g(){  
  
}
```



```
function f(){
```

Body

```
}
```

```
function g(){
```

```
}
```

```
function f(){
```

Body

```
}
```

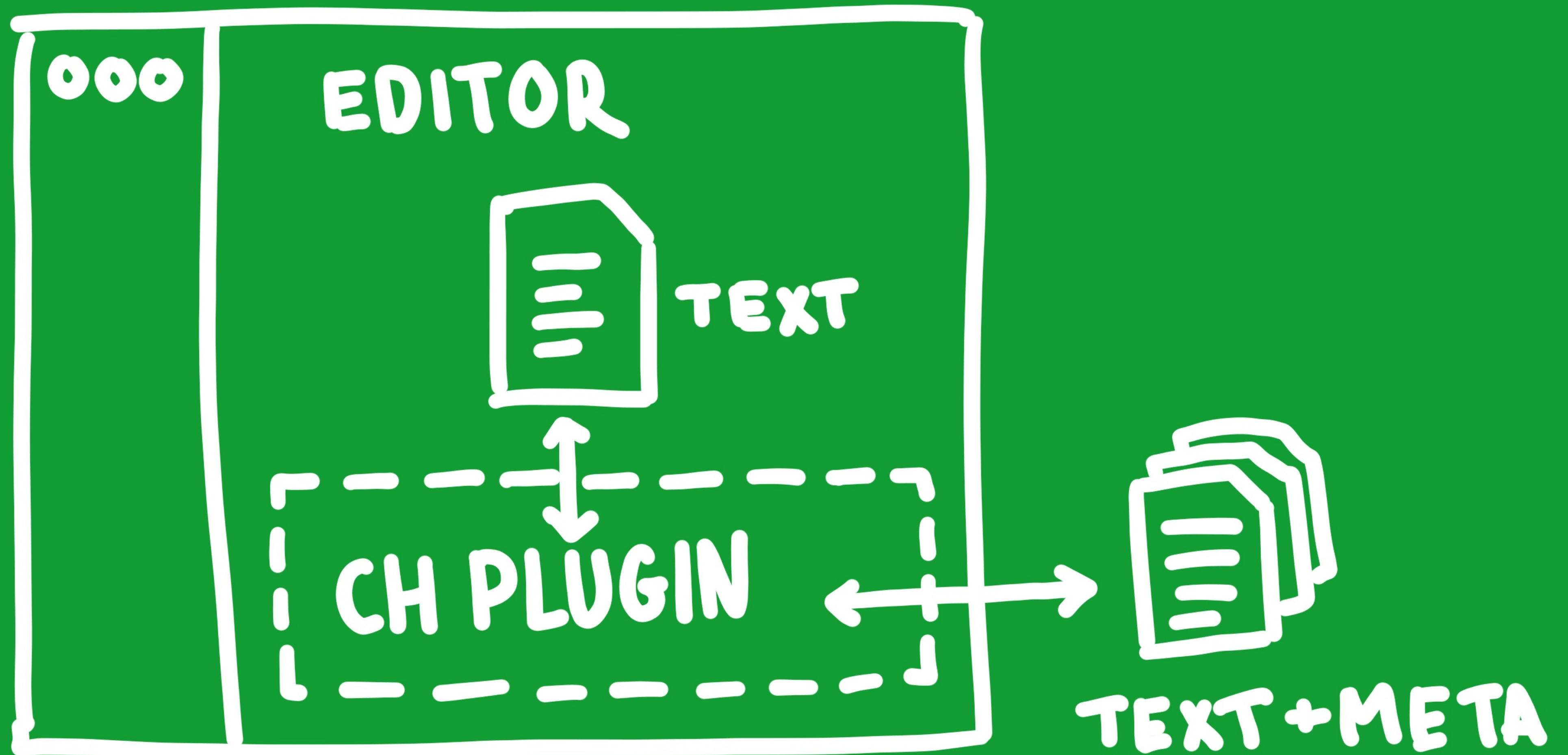
```
function g(){
```

```
}
```



Google Docs uses people

3. EDITOR LOCK-IN



MY PREDICTION ~~for~~ 2018

- 1 editing will be painful
- 2 SOME conflicts will be avoided

The truth is OUT THERE