

Time in an Event Sourced World

CheckedOut

ItemsRemoved

ItemsRemoved

ItemsAdded

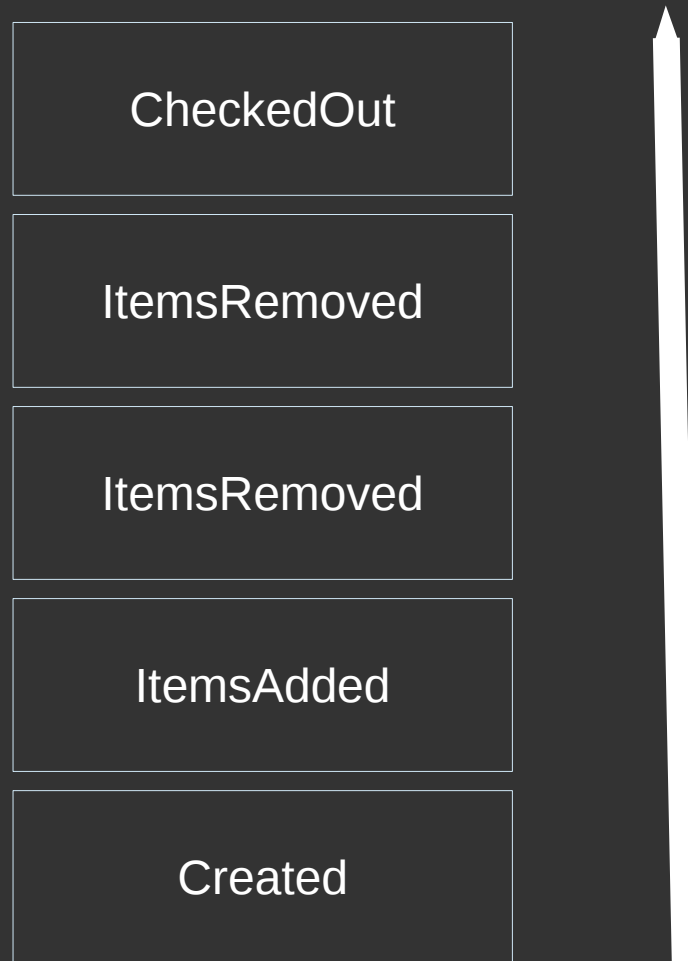
Created



Isn't linearization awesome :O

But what about things that are
out of order?

*pun intended



Well how could they be?!

ALEX J. CUSTOMER
1234 ANY STREET
YOUR CITY, STATE, 12345-5678

Date 7/6/2017 101

Pay to the
Order of Electric Company \$ 130.45

One hundred thirty and 45/100 Dollars

Memo July electric bill Alex J. Customer



ALEX J. CUSTOMER
1234 ANY STREET
YOUR CITY, STATE, 12345-5678

Date 7/6/2017 101

Pay to the Order of Electric Company \$ 130.45

One hundred thirty and 45/100 Dollars

Memo July electric bill Alex J. Customer

Min of Two Times!!!

This is a TIME!

ALEX J. CUSTOMER
1234 ANY STREET
YOUR CITY, STATE, 12345-678

Date 7/6/2017 101

Pay to the
Order of Electric Company \$ 130.45

One hundred thirty and 45/100 Dollars

Memo July electric bill Alex J. Customer

When I RECEIVE it is a ...
TIME

This is a TIME!

ALEX J. CUSTOMER
1234 ANY STREET
YOUR CITY, STATE, 12345-678

Date 7/6/2017

101

Pay to the
Order of Electric Company \$ 130.45

One hundred thirty and 45/100 Dollars

Memo July electric bill Alex J. Customer

When I RECEIVE it is a ...
TIME

This is a TIME!

ALEX J. CUSTOMER 1234 ANY STREET YOUR CITY, STATE, 12345-678		Date <u>7/6/2017</u>	101
Pay to the Order of	<u>Electric Company</u>	\$	<u>130.45</u>
<u>One hundred thirty and 45/100</u>		Dollars	
Memo	<u>July electric bill</u>	<u>Alex J. Customer</u>	

Hey when did I
DEPOSIT it?

When I RECEIVE it is a ...
TIME

This is a TIME!

ALEX J. CUSTOMER 1234 ANY STREET YOUR CITY, STATE, 12345-678		Date <u>7/6/2017</u>	101
Pay to the Order of	<u>Electric Company</u>	\$	<u>130.45</u>
<u>One hundred thirty and 45/100</u>			Dollars
Memo	<u>July electric bill</u>		
<u>Alex J. Customer</u>			

Hey when did I
DEPOSIT it?

Hey when does it
CLEAR?

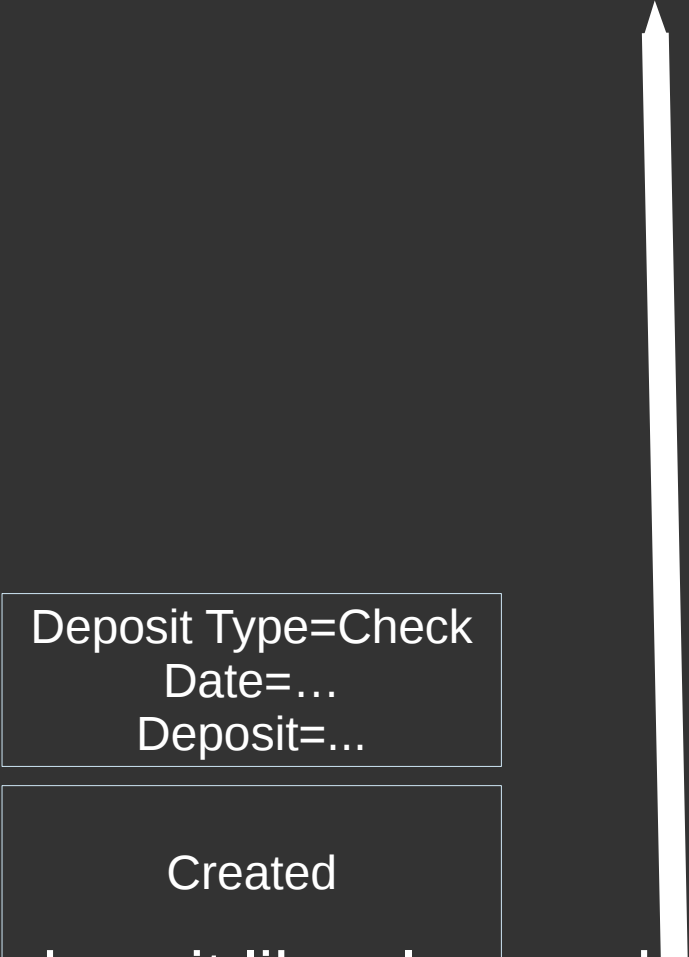
ACTUALLY..

There are another 10+ dates for internal tracking if you are a bank

Deposit Type=Check
Date=...
Deposit=...

Created





Deposit Type=Check
Date=...
Deposit=...

Created

When does it like clear and stuff?

Do subscribers know this?

Should I like wait on that event?

What if it doesn't happen?

Deposit Type=Check
Date=...
Deposit=...
ExpectedToClear=...

Created



Cleared

Deposit Type=Check
Date=...
Deposit=...
ExpectedToClear=...

Created



What if I want to change the future
date/expectation? :O

Clearance Expectation
Changed

Deposit Type=Check
Date=...
ToDeposit=...
ExpectedToClear=...

Created



What if many things have
expectations?

Do I know about all of them?!

What if its **post**-dated?
Is that the **same**??

What if it **never** clears?

What if I want to change the future
date/expectation eg
“AccountPlacedOnInvisibleGovtHold”?

Event Sourcing Represents ...
Linear Time

CheckedOut

ItemsRemoved

ItemsRemoved

ItemsAdded

Created



Our log is ordered!

Just like a **cough cough** “journal”

We can deterministically say:
“The cart had the item “added”
before the item was “removed”!”

Yay!

CheckedOut

ItemsRemoved

ItemsRemoved

ItemsAdded

Created



or ... can we?

#\$%^ \$%^& @#\$% ^\$##

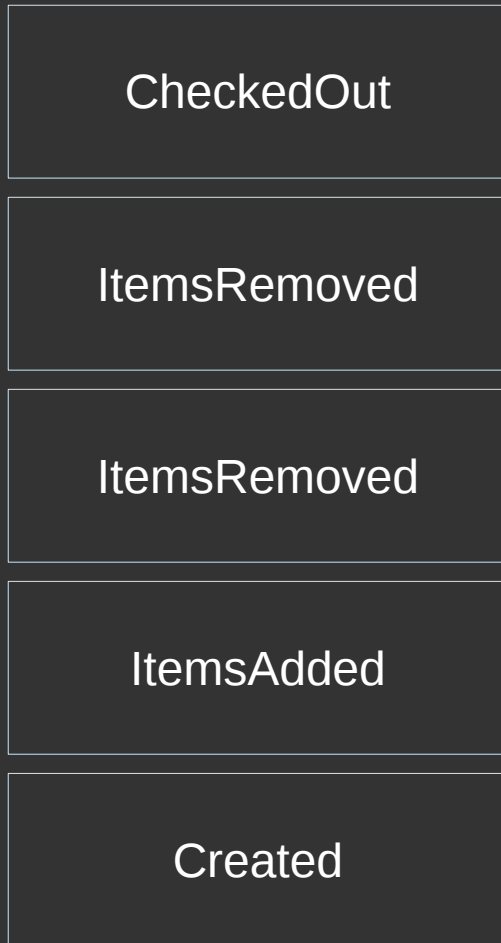
What about :
Occasionally Connected Systems?

git
cough cough

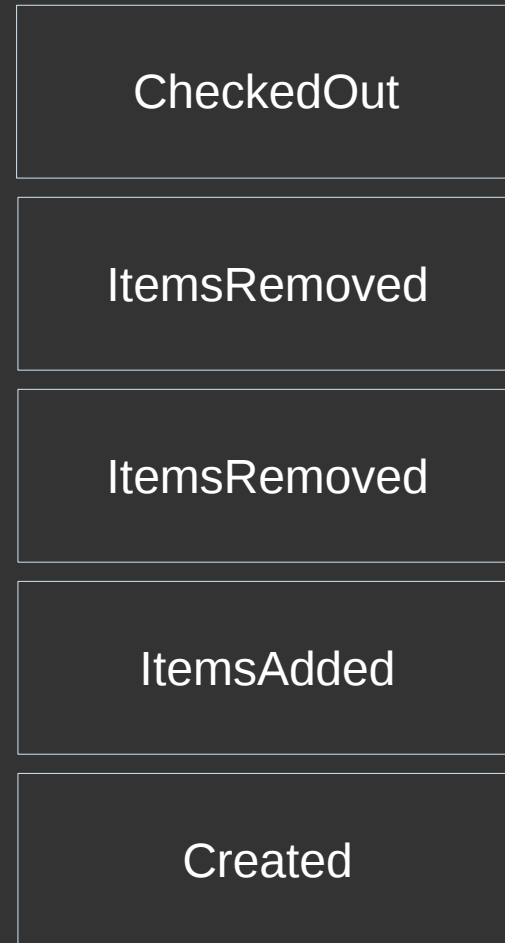
Geographic Distribution is another
common case.

Coordination has ... costs.

Site A

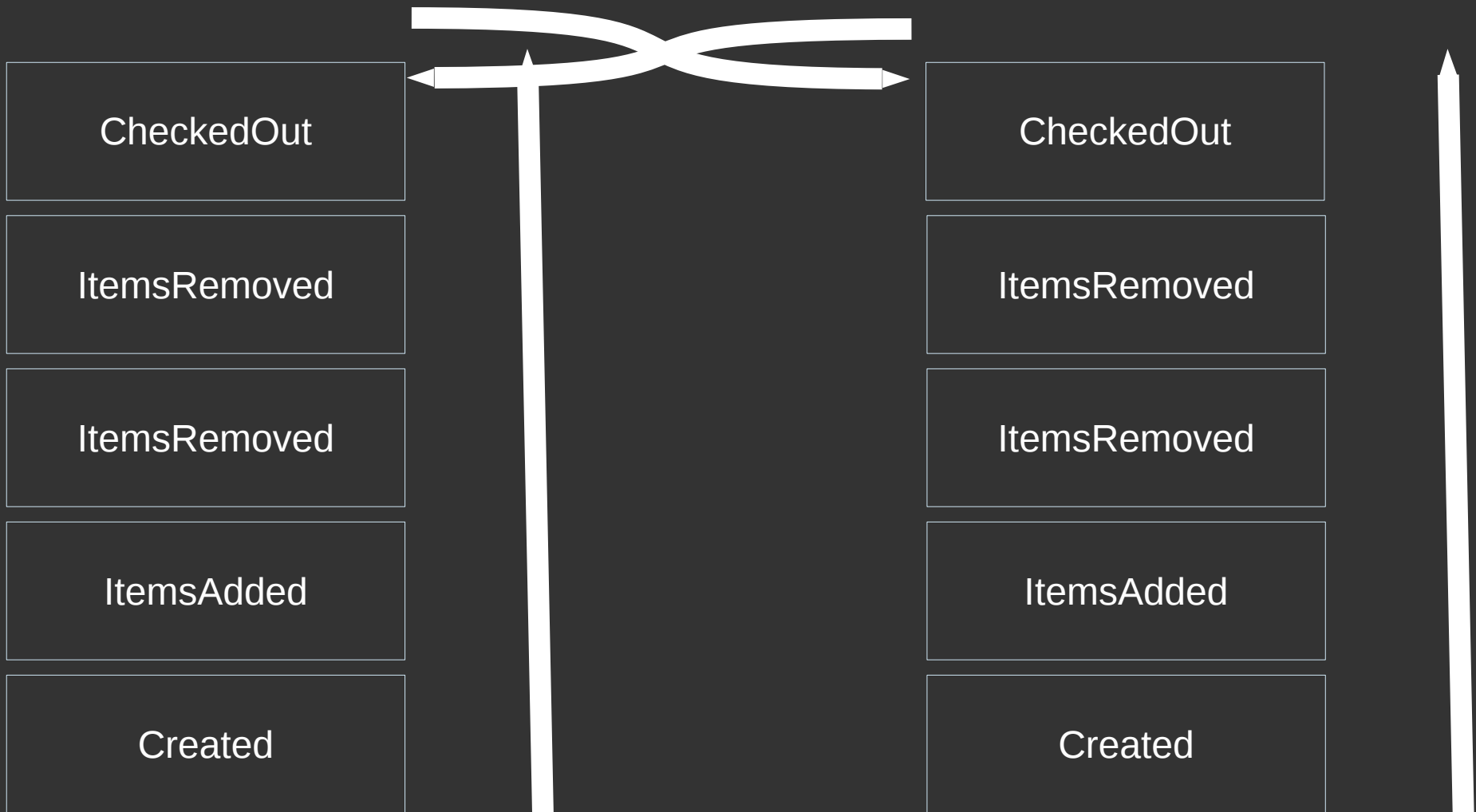


Site B



Site A

Site B



We are just getting started!
What about replication say Cross
DC where we want to be AP ;-)

Site A

Site B



Site A

Site B



Site A

Site B

CheckedOut

ItemsRemoved

ItemsRemoved

ItemsAdded

Created

CheckedOut

ItemsRemoved

ItemsAdded

ItemsRemoved

Created

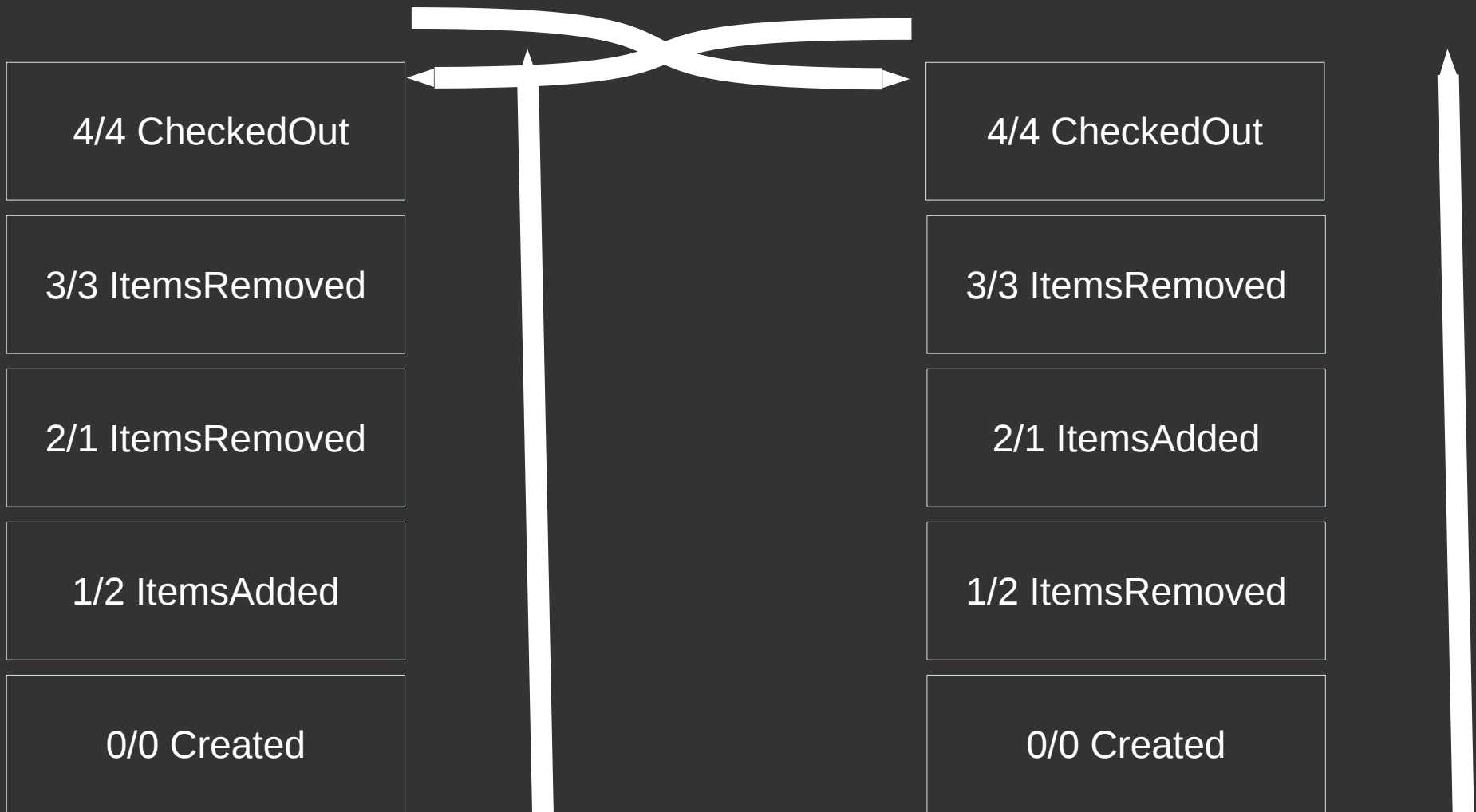
WHO did the **Items Removed**? :)
WHAT did they **know** at **that time**? :)
DID they know **enough**? :)
DO we **trust** them?! :O

Can I detect this?

Expected Version!
Aka
Original Version!

Site A

Site B



Site A

Site B

4/4 CheckedOut

3/3 ItemsRemoved

2/1 ItemsRemoved

1/2 ItemsAdded

0/0 Created

4/4 CheckedOut

3/3 ItemsRemoved

2/1 ItemsAdded

1/2 ItemsRemoved

0/0 Created

Conflict Detected
to \$conflicts?

Writing with Expected Version
finds conflicts...

KEEP IT

Not everything has one time
associated to it :O

Not all Event Sourced systems
are linearized!

Its more about choices

What safety do you need?

What are you willing to trade?

Is this talk over or just on a funny
timeline and the introduction now
starts?

Questions?