

Data sync optimization

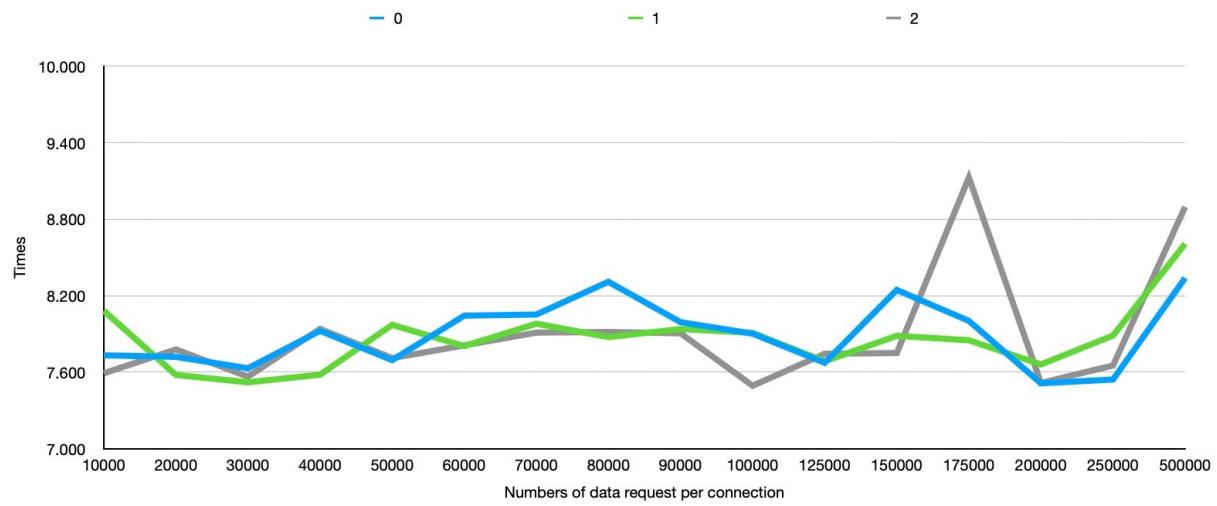
Chonlakornn

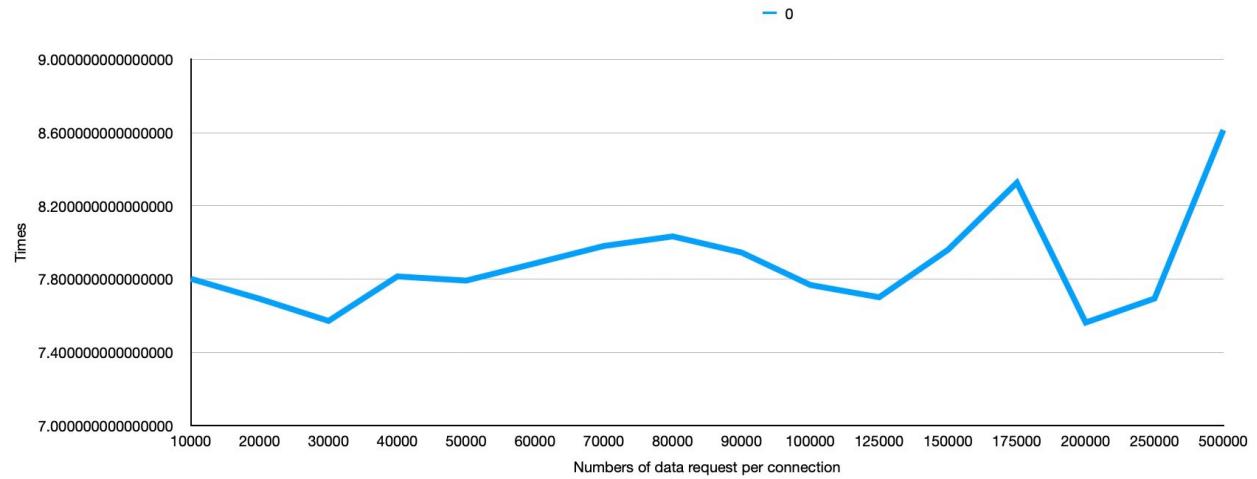
Chonlakorn Maturosjamnan 6230096621

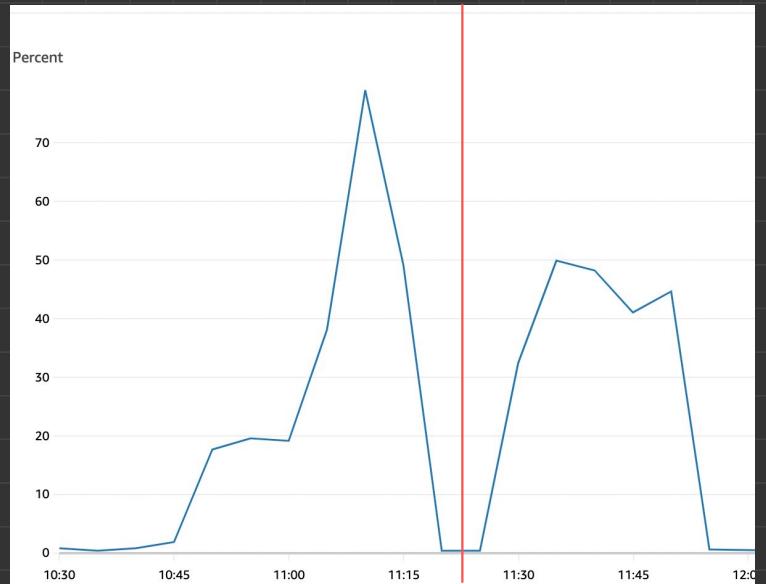
Network

Database – Server

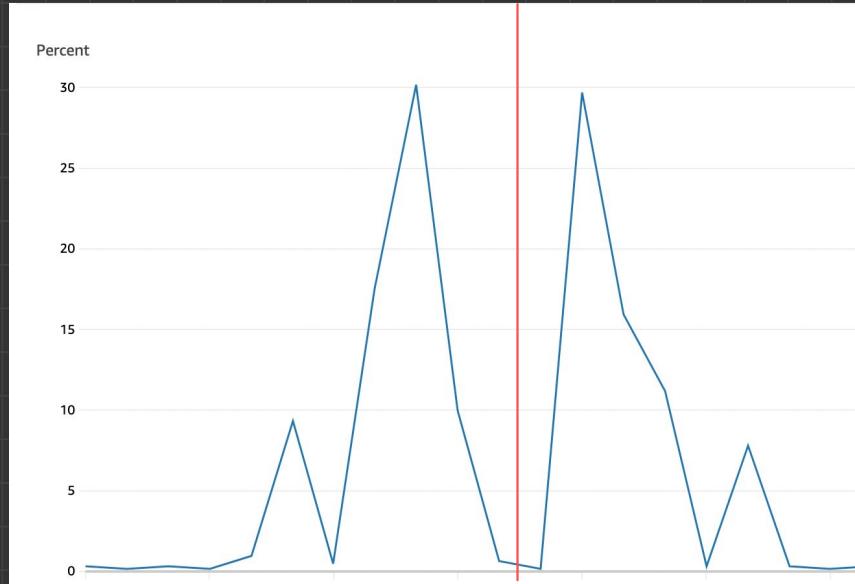
Server – Client







Server



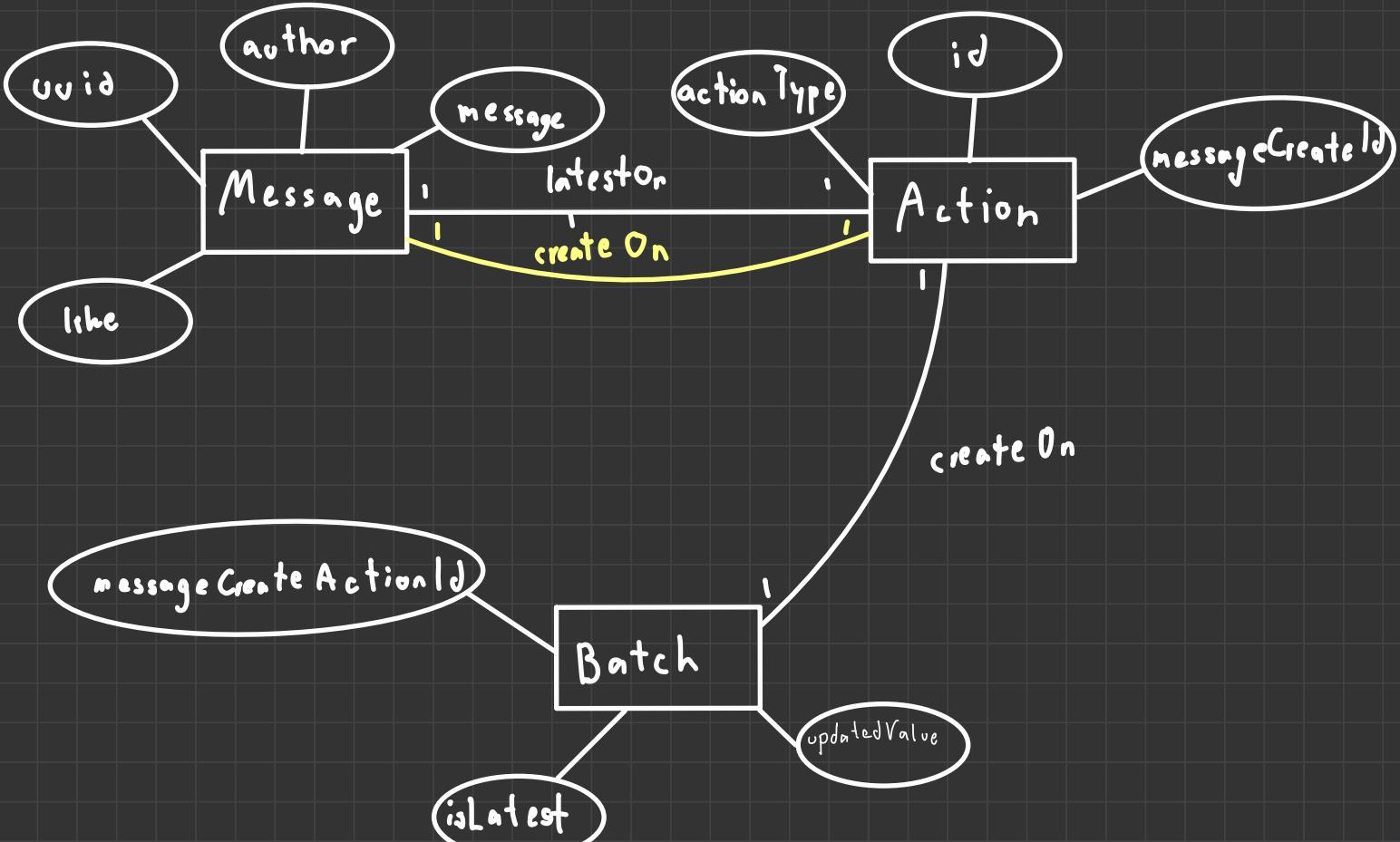
Database

```
FATAL ERROR: Reached heap limit Allocation failed - JavaScript heap out of memory
1: 0xb306d0 node::Abort() [node]
2: 0xa4219e node::FatalError(char const*, char const*) [node]
3: 0xd2c9e v8::Utils::ReportOOMFailure(v8::internal::Isolate*, char const*, bool) [node]
4: 0xd23017 v8::internal::V8::FatalProcessOutOfMemory(v8::internal::Isolate*, char const*, bool) [node]
5: 0xedc445 [node]
6: 0xedc88d v8::internal::Heap::CollectGarbage(v8::internal::AllocationSpace, v8::internal::GarbageCollectionReason, v8::GCCallbackFlags) [node]
7: 0xef05be v8::internal::Heap::AllocateRawWithRetryOrFailSlowPath(int, v8::internal::AllocationType, v8::internal::AllocationOrigin, v8::internal::AllocationAlignment) [node]
8: 0xeb1d12 v8::internal::Factory::AllocateRaw(int, v8::internal::AllocationType, v8::internal::AllocationAlignment) [node]
9: 0xaea574 v8::internal::FactoryBase<v8::internal::Factory>::AllocateRawWithImmortalMap(int, v8::internal::AllocationType, v8::internal::Map, v8::internal::AllocationAlignment) [node]
10: 0xaeac2b0 v8::internal::FactoryBase<v8::internal::Factory>::NewRawOneByteString(int, v8::internal::AllocationType) [node]
11: 0x128f405 v8::internal::IncrementalStringBuilder::Extend() [node]
12: 0xfe1410 v8::internal::JsonStringifier::SerializeString(v8::internal::Handle<v8::internal::String>) [node]
13: 0xfe34a1l v8::internal::JsonStringifier::Result v8::internal::JsonStringifier::Serialize_<true>(v8::internal::Handle<v8::internal::Object>, bool, v8::internal::Handle<v8::internal::Object>) [node]
14: 0xfe6f01 v8::internal::JsonStringifier::Result v8::internal::JsonStringifier::Serialize_<false>(v8::internal::Handle<v8::internal::Object>, bool, v8::internal::Handle<v8::internal::Object>) [node]
15: 0xfe7fd1 v8::internal::JsonStringifier::SerializeArrayLikeSlow(v8::internal::Handle<v8::internal::JSReceiver>, unsigned int, unsigned int) [node]
16: 0xfe4354 v8::internal::JsonStringifier::Result v8::internal::JsonStringifier::Serialize_<true>(v8::internal::Handle<v8::internal::Object>, bool, v8::internal::Handle<v8::internal::Object>) [node]
17: 0xfe6f01 v8::internal::JsonStringifier::Result v8::internal::JsonStringifier::Serialize_<false>(v8::internal::Handle<v8::internal::Object>, bool, v8::internal::Handle<v8::internal::Object>) [node]
18: 0xfe881f v8::internal::JsonStringify(v8::internal::Isolate*, v8::internal::Handle<v8::internal::Object>, v8::internal::Handle<v8::internal::Object>, v8::internal::Handle<v8::internal::Object>) [node]
19: 0xda3ba7 v8::internal::Builtin_JsonStringify(int, unsigned long*, v8::internal::Isolate*) [node]
20: 0x16359b9 [node]
```

Python thread

CPU Time

Cheap query
Low miss rate



ER Diagram

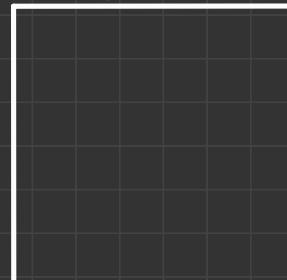
Action Table

input

uvvid
author
message
likes

id: auto-gen
actionType: create
messageCreateId: id

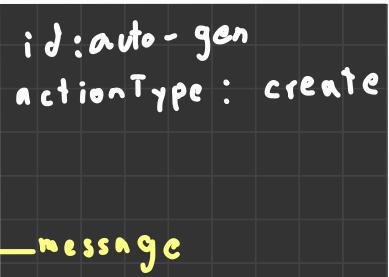
Message Table



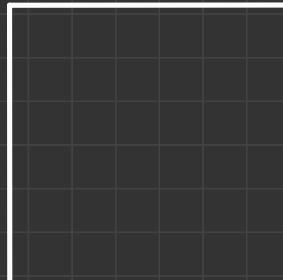
Create

Action Table

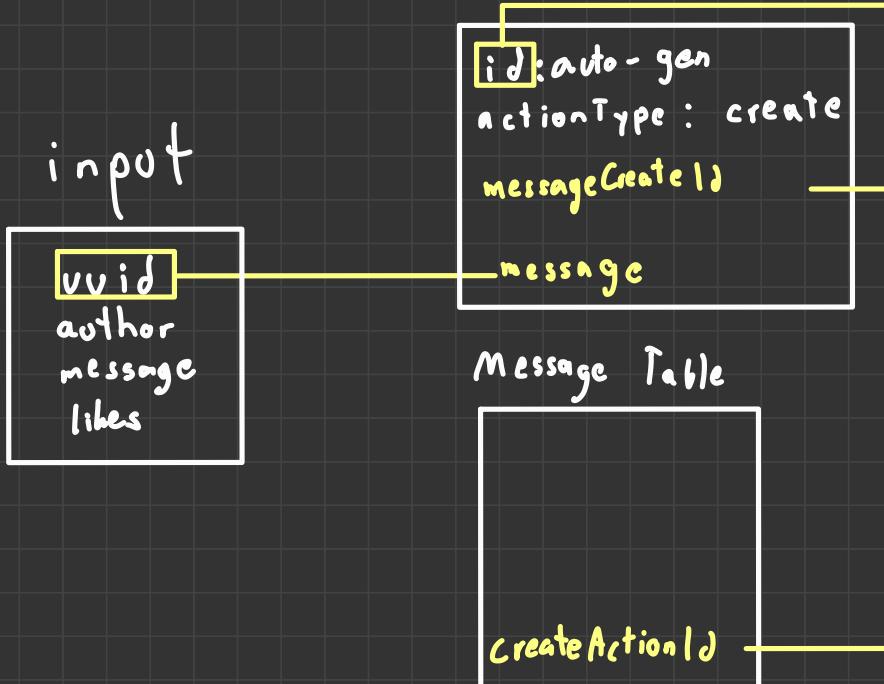
input



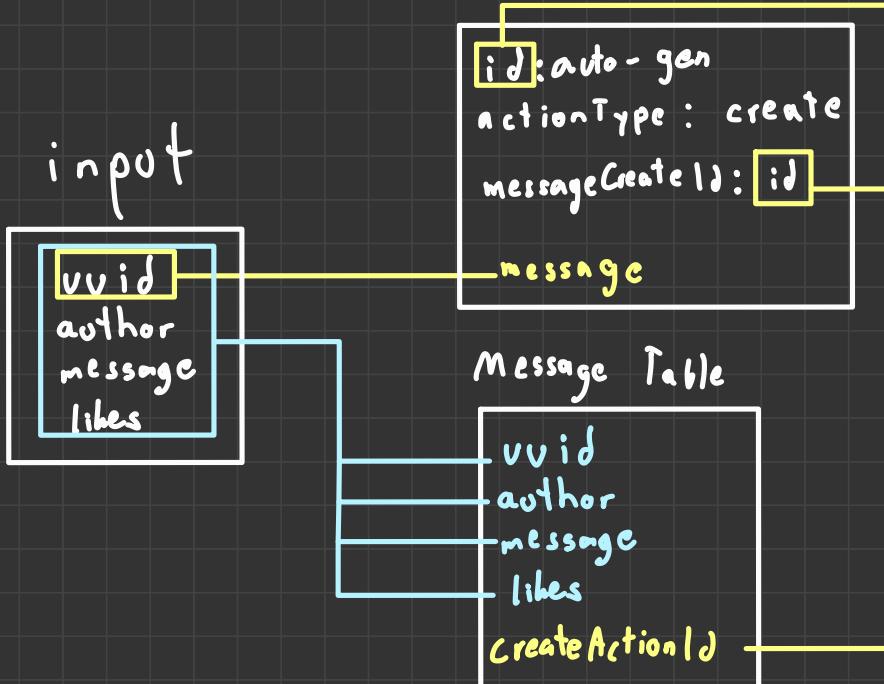
Message Table



Action Table



Action Table



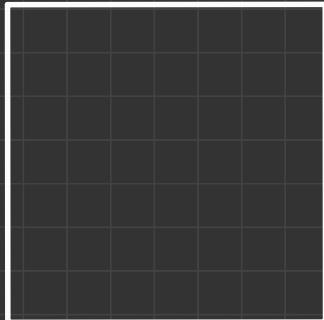
Action Table

`id:auto-gen
actionType:update`

filtered input

`uvId
author
message
likes`

Message Table



Update

Action Table

```
id:auto-gen  
actionType:update
```

filtered input

vivid
author
message
likes

find

Message Table

vivid

CreateActionId

Action Table

id:auto-gen
actionType:update

filtered input

vvid
author
message
likes

find

Message Table

vvid
author
message
likes
CreateActionId

Action Table

id:auto-gen
actionType: update

filtered input

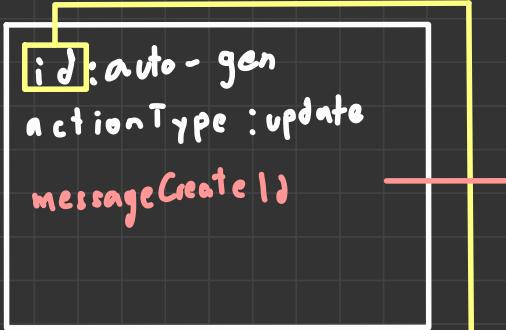
vivid
author
message
likes

find

Message Table

vivid
author
message
likes
CreateActionId
latest Action -

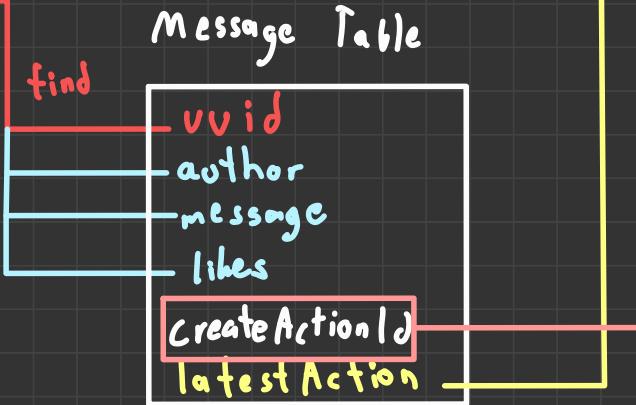
Action Table



filtered input



Message Table



find

Author MessageBatch Table

actionId
isLatest: true
messageCreateActionId

Text MessageBatch Table

actionId
isLatest: true
messageCreateActionId

uvId
author
message
likes
createActionId
latestAction

Likes MessageBatch Table

actionId
isLatest: true
messageCreateActionId

Author MessageBatch Table

actionId
isLatest: true
messageCreateActionId
updatedValue

Text MessageBatch Table

actionId
isLatest: true
messageCreateActionId
updatedValue

uvId
author
message
likes
createActionId
latestAction

Likes MessageBatch Table

actionId
isLatest: true
messageCreateActionId
updatedValue

Author MessageBatch Table

actionId	old that isLatest:true
isLatest:true	isLatest:false
messageCreateActionId	
updatedValue	

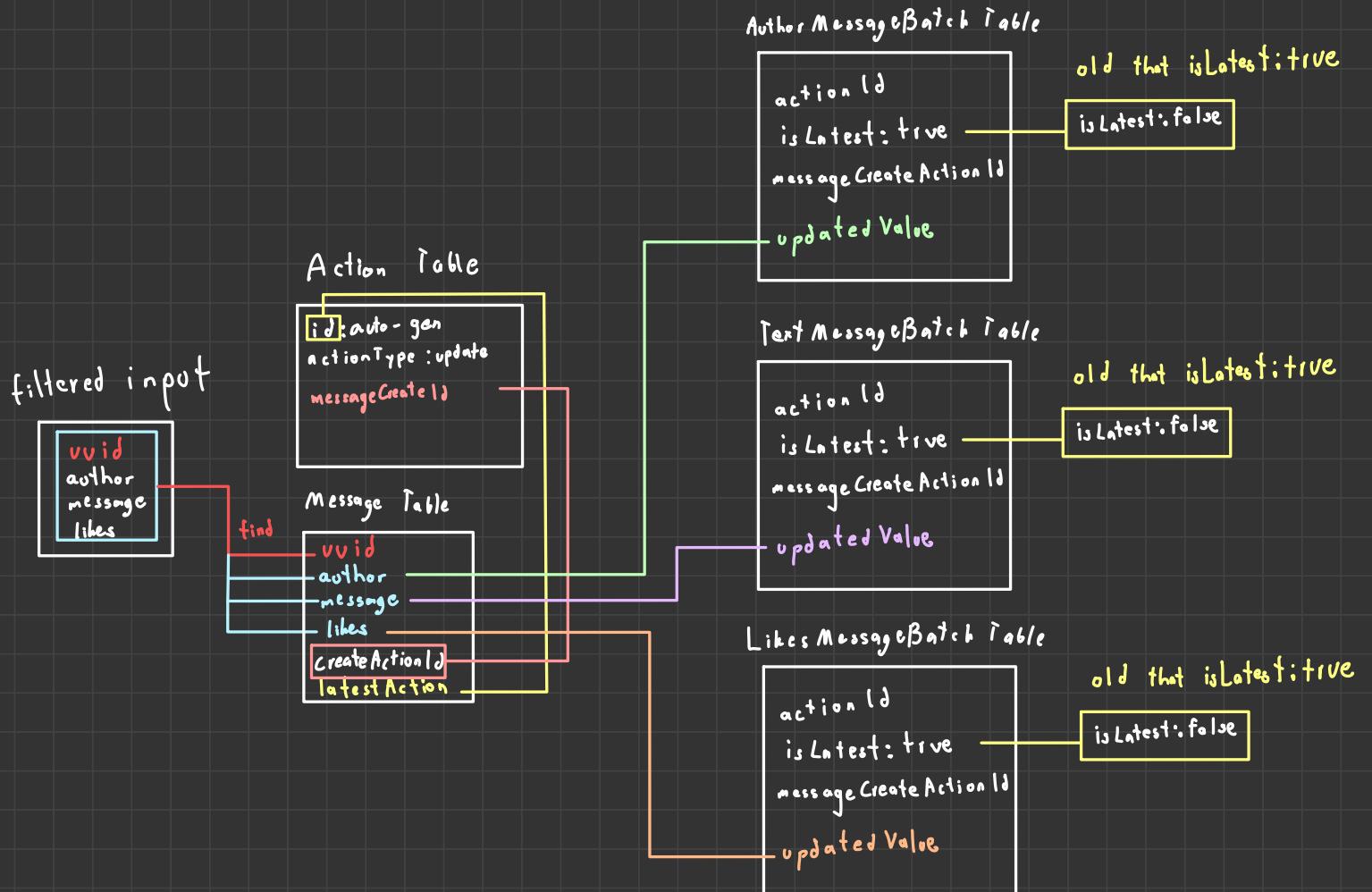
Text MessageBatch Table

actionId	old that isLatest:true
isLatest:true	isLatest:false
messageCreateActionId	
updatedValue	

uvid	
author	
message	
likes	
createActionId	
latestAction	

Likes MessageBatch Table

actionId	old that isLatest:true
isLatest:true	isLatest:false
messageCreateActionId	
updatedValue	



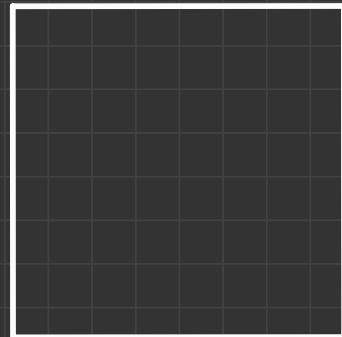
Action Table

filtered input

`id: auto-gen`
`actionType: delete`

`uvid`

Message Table



Delete

Action Table

filtered input

`id: auto-gen`
`actionType: delete`

`vvid`

Message Table

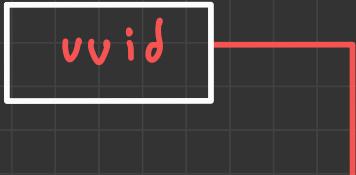
`vvid`

`find and delete`

`CreateActionId`

Action Table

filtered input



Message Table



find and delete

latest Action = 85

Message Table

Create Action Id

1
2
5
:
80
92
:
200,000

Create

latest Action = 85

Message Table	
Create Action Id	
1	
2	
5	
:	
80	
92	
:	
200,000	

Message Batch Table

isolate	actionId	messageCreateId
True	20	
	40	
	:	:
	90	8
	100	87
	110	105
	120	3

latest Action = 85

isolate	actionId	messageCreateId
False		
	:	:

Message Batch Table

isolate	actionId	messageCreateId
True	20	
	40	
	:	:
	90	8
	100	87
	110	105
	120	3

latest Action = 85

isolate	actionId	messageCreateId
False		
	:	:

Message Batch Table

isolate	actionId	messageCreateId
True	20	
	40	
	:	:
	90	8
	100	87
	110	105
	120	3

latest Action = 85

isolate	actionId	messageCreateId
False		
	:	:

Action Table

Type	id	messageCreateId
create		
	:	:

Type	id	messageCreateId
update		
	:	:

Latest Action = 85

Type	id	messageCreateId
delete	50	
	50	
	:	:
	91	9
	101	88
	111	106
	121	4

Action Table

Type	id	messageCreateId
create		
...

Type	id	messageCreateId
update		
...

latest Action = 85

Type	id	messageCreateId
delete	50	
	50	
...
	91	9
	101	88
	111	106
	121	4

Action Table

Type	id	messageCreateId
create		
...

Type	id	messageCreateId
update		
...

latest Action = 85

Type	id	messageCreateId
delete	50	
	50	
...
	91	9
	101	88
	111	106
	121	9

Message Table

Create ActionId
1
2
3
...
80
92
...
200,000

latest Action = 85

Message Batch Table

isolate	actionId	messageCreateId
True	20	
	40	
	...	
	90	8
	100	97
	110	105
	120	3

isolate	actionId	messageCreateId
False

latest Action = 85

Action Table

Type	id	messageCreateId
create

Type	id	messageCreateId
update

Type	id	messageCreateId
delete	30	
	50	
	...	
	91	9
	101	98
	111	106
	121	4

latest Action = 85

Client Server

Server - Nestjs
Client - Pandas