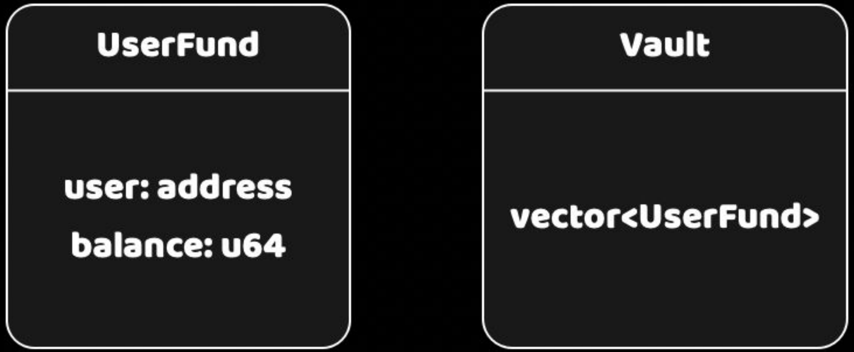
TYPUS

Big Uector Implementation

BUILT ON sui

Array?Vector?



UserFund

user: address

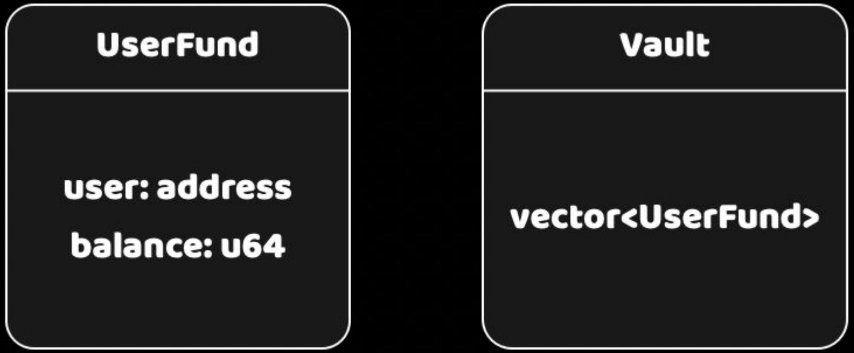
balance: u64

Vault

vector<UserFund>

max_move_vector_len: Some(256 * 1024)
= 262,144 elements

max_move_object_size: Some(250 * 1024)
= 256,000 bytes



UserFund

user: address

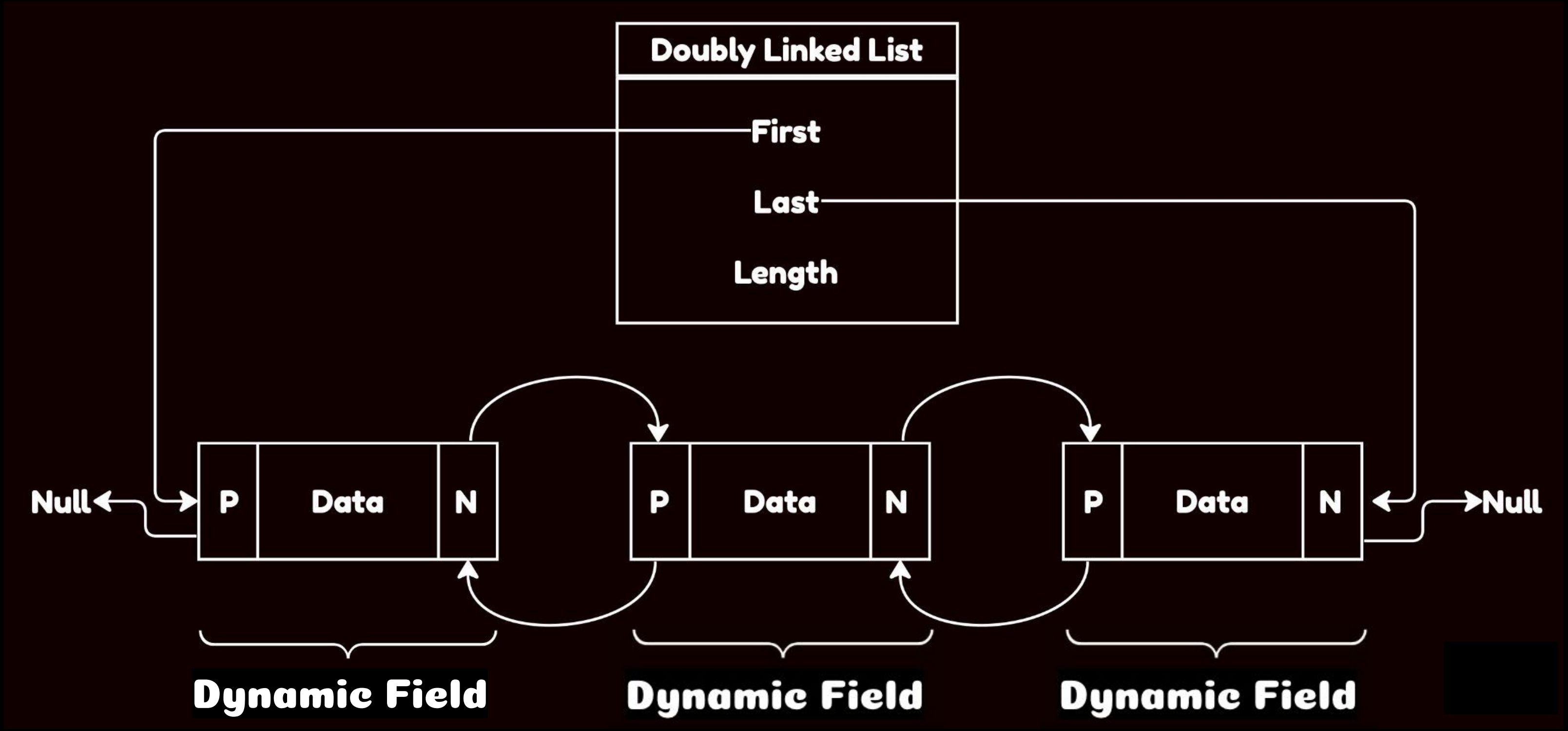
balance: u64

Vault

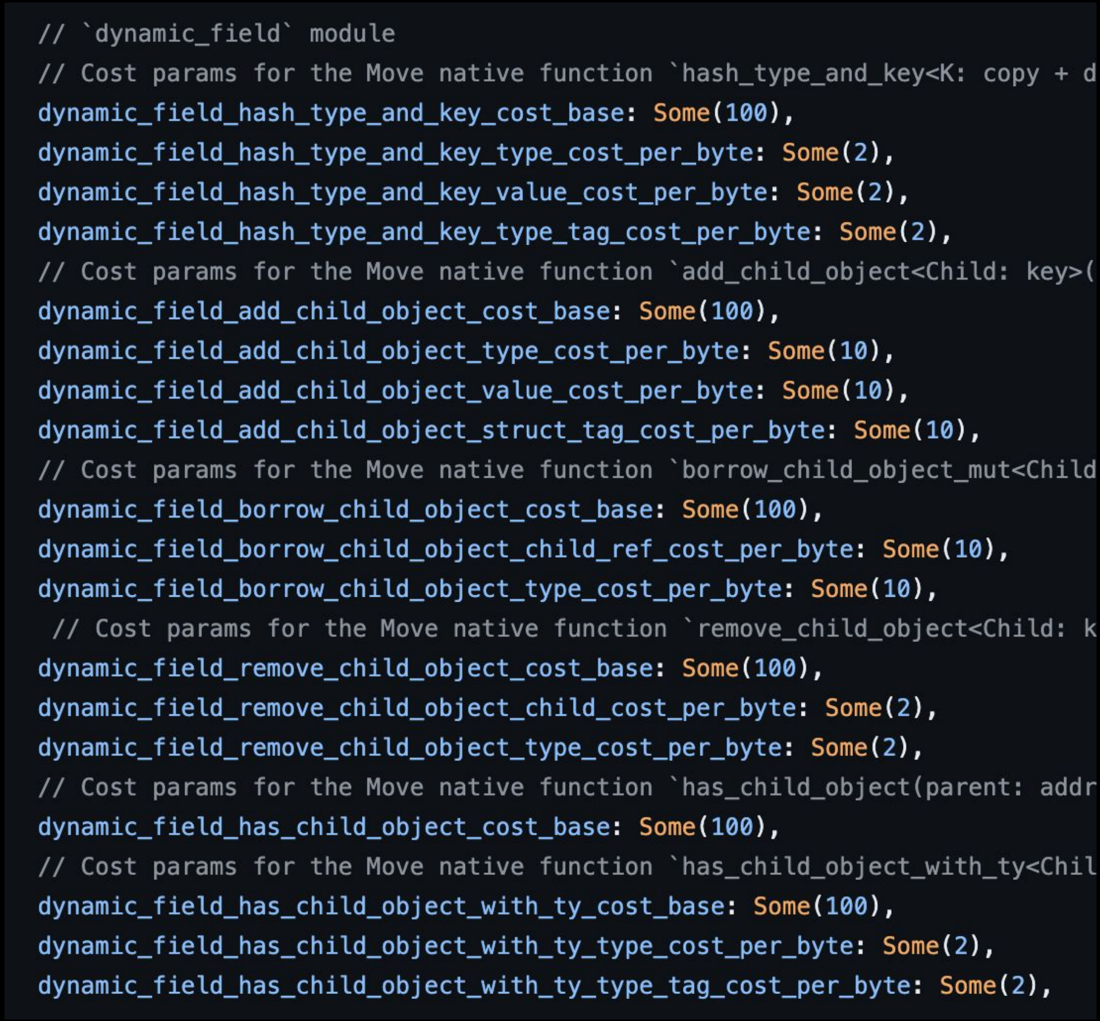
vector<UserFund>

256,000 / 40 = 6,400 elements

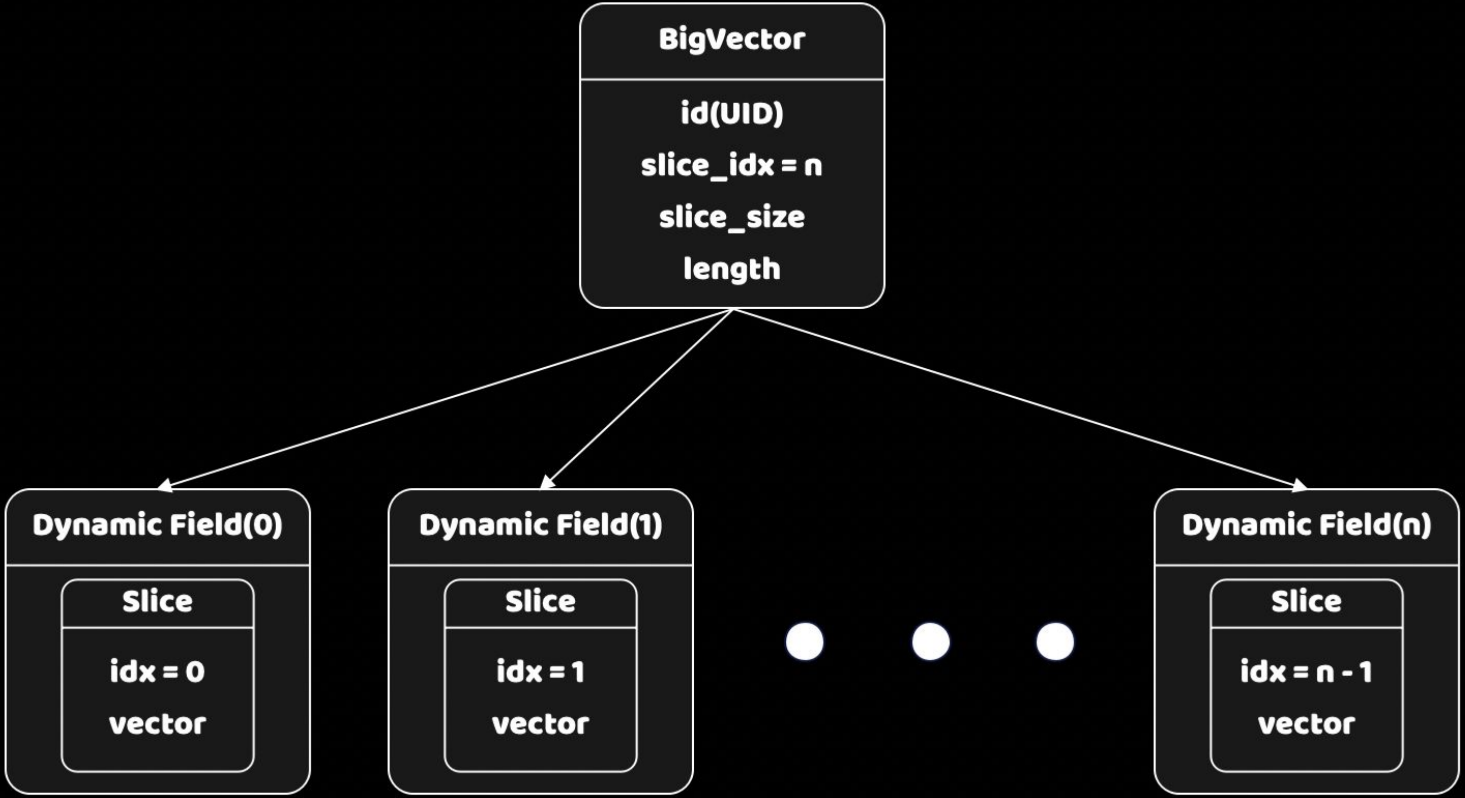
Linked List


Doubly Linked List
First
Last
Length
Null
P
Data
N
P
Data
N
P
Data
N
Null
Dynamic Field
Dynamic Field
Dynamic Field

object_runtime_max_num_cached_objects: Some(1000)



```
// `dynamic_field` module
// Cost params for the Move native function `hash_type_and_key<K: copy + d
dynamic_field_hash_type_and_key_cost_base: Some(100),
dynamic_field_hash_type_and_key_type_cost_per_byte: Some(2),
dynamic_field_hash_type_and_key_value_cost_per_byte: Some(2),
dynamic_field_hash_type_and_key_type_tag_cost_per_byte: Some(2),
// Cost params for the Move native function `add_child_object<Child: key>(
dynamic_field_add_child_object_cost_base: Some(100),
dynamic_field_add_child_object_type_cost_per_byte: Some(10),
dynamic_field_add_child_object_value_cost_per_byte: Some(10),
dynamic_field_add_child_object_struct_tag_cost_per_byte: Some(10),
// Cost params for the Move native function `borrow_child_object_mut<Child
dynamic_field_borrow_child_object_cost_base: Some(100),
dynamic_field_borrow_child_object_child_ref_cost_per_byte: Some(10),
dynamic_field_borrow_child_object_type_cost_per_byte: Some(10),
 // Cost params for the Move native function `remove_child_object<Child: k
dynamic_field_remove_child_object_cost_base: Some(100),
dynamic_field_remove_child_object_child_cost_per_byte: Some(2),
dynamic_field_remove_child_object_type_cost_per_byte: Some(2),
// Cost params for the Move native function `has_child_object(parent: addr
dynamic_field_has_child_object_cost_base: Some(100),
// Cost params for the Move native function `has_child_object_with_ty<Chil
dynamic_field_has_child_object_with_ty_cost_base: Some(100),
dynamic_field_has_child_object_with_ty_type_cost_per_byte: Some(2),
dynamic_field_has_child_object_with_ty_type_tag_cost_per_byte: Some(2),
```


BigVector
id(UID)
slice_idx = n
slice_size
length
Dynamic Field(0)
Slice
idx = 0
vector
Dynamic Field(1)
Slice
idx = 1
vector
Dynamic Field(n)
Slice
idx = n - 1
vector

Linked List

10,000 user / 1,000 objects = 10 transactions

access 10,000 dynamic fields

10,000 × 100 cost base = 1,000,000 units

Big Vector

10,000 user / 1,000 slice_size = 10 Slices

access only 10 dynamic fields

10 × 100 cost base = 1,000 units

1,000,000 users

Linked List

1,000,000 / 1,000 = 1000 transactions

Big Vector

1,000,000 / 1,000 = 1000 Slices

operate 1000 Slices in 1 transaction

Typus Finance

https://typus.finance/

Big Vector Research

https://medium.com/@TypusFinance/big-vector-and-its-potential-for-hyper-scalability-on-sui-23265725a3d0

Sui Improvement Proposal

https://github.com/sui-foundation/sips/pull/13

Protocol Config

https://github.com/MystenLabs/sui/blob/main/crates/sui-protocol-config/src/lib.rs