

Mktplace

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SPECIAL THANKS TO: PREETHI KASIREDDY, SAMEE SIDDIQUI, JULIAN MARTINEZ



Mktplace

The Pitch

The NFT market has 2 big problems.





20


Bored Ape Yacht Club


Owned by [niftrr](#) 1.2K views 20 favorites

Sale ends in **31 days** (September 28, 2021 at 4:38am EDT)

Minimum bid -- Reserve price not met.

 **185** (\$599,829.20) 

 Place bid


 Listings

Mktplace

The Pitch

The NFT market has 2 big problems.

1. Volume is too low to accurately estimate value.



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Sale ends in **31 days** (September 28, 2021 at 4:38am EDT)

Minimum bid -- Reserve price not met.

185 (\$599,829.20) ↗

Place bid


Listings

This BAYC has only sold 3 times.

The seller is **only guessing** it's worth 185 ETH.

Price History

All Time ▾ All Time Avg. Price **5.65**



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The Pitch

The NFT market has 2 big problems.

1. Volume is too low to accurately estimate value.
2. No incentive to place low-ball bids = No on-chain demand curves.



Why bother with this **low-ball bid**?

The 25 ETH is stagnant & **not** generating yield.

It **can't** be used by the seller to access debt.

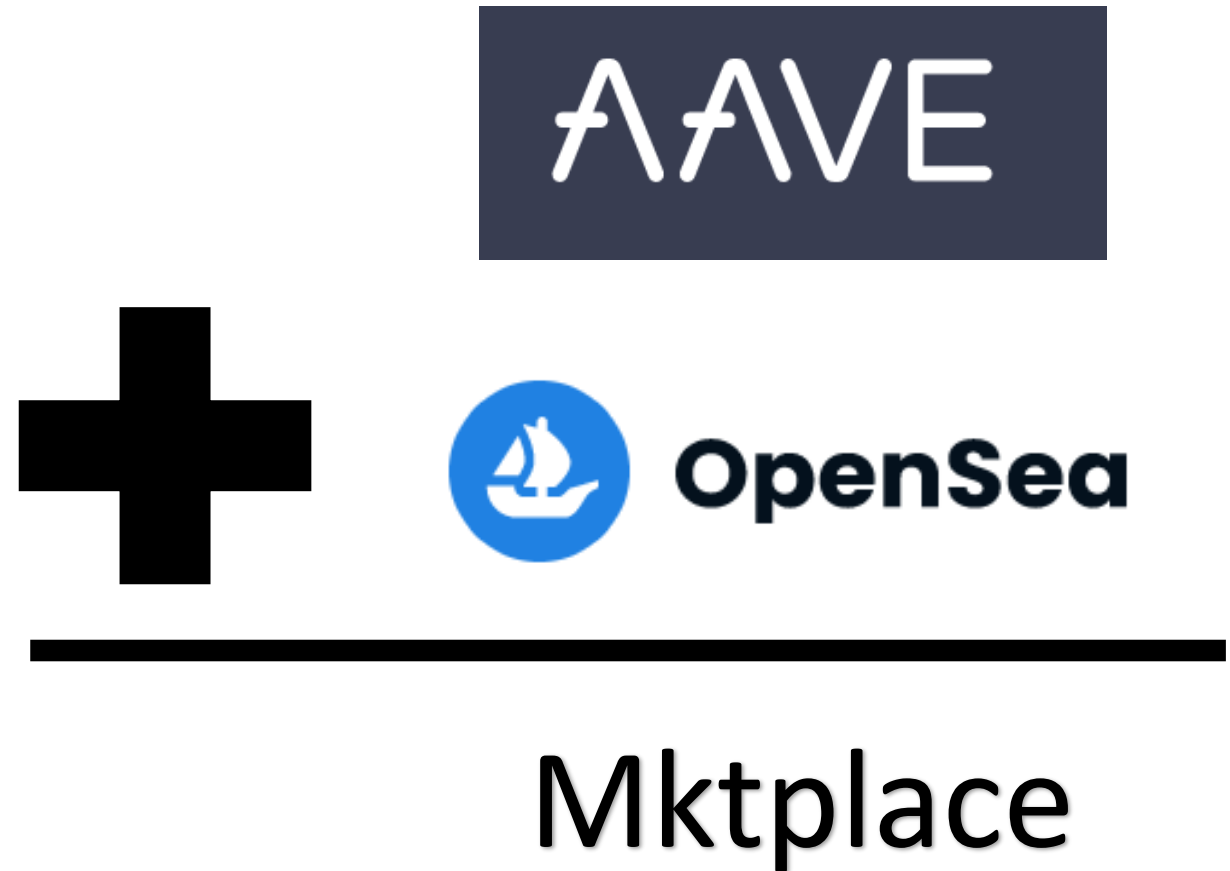
Offers

Price	USD Price
 25.0099 WETH	\$81,090.10

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The Pitch

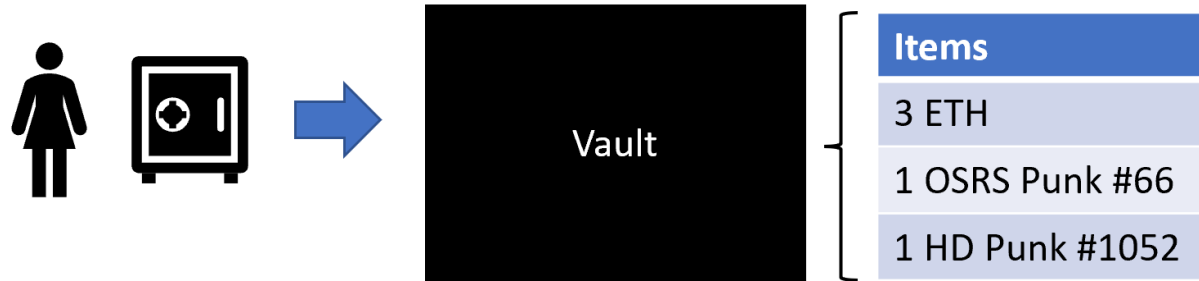
Mktplace proposes certificate of deposit auctions for any arbitrarily complex vault (not just NFTs!) to solve both problems at once.



Mktplace

The Pitch

Alice puts some assets
in a vault.

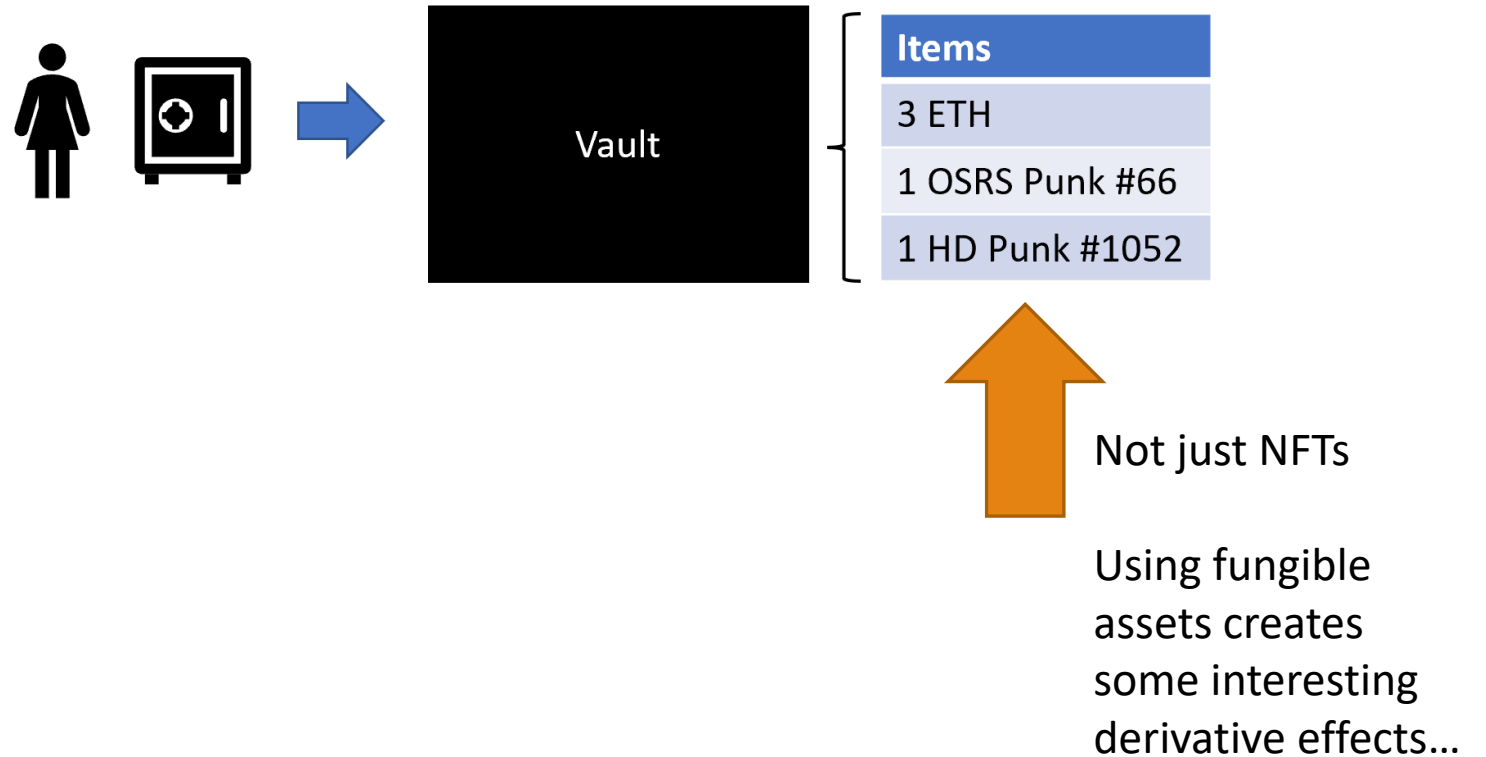


Mktplace

The Pitch

Alice puts some assets in a vault.

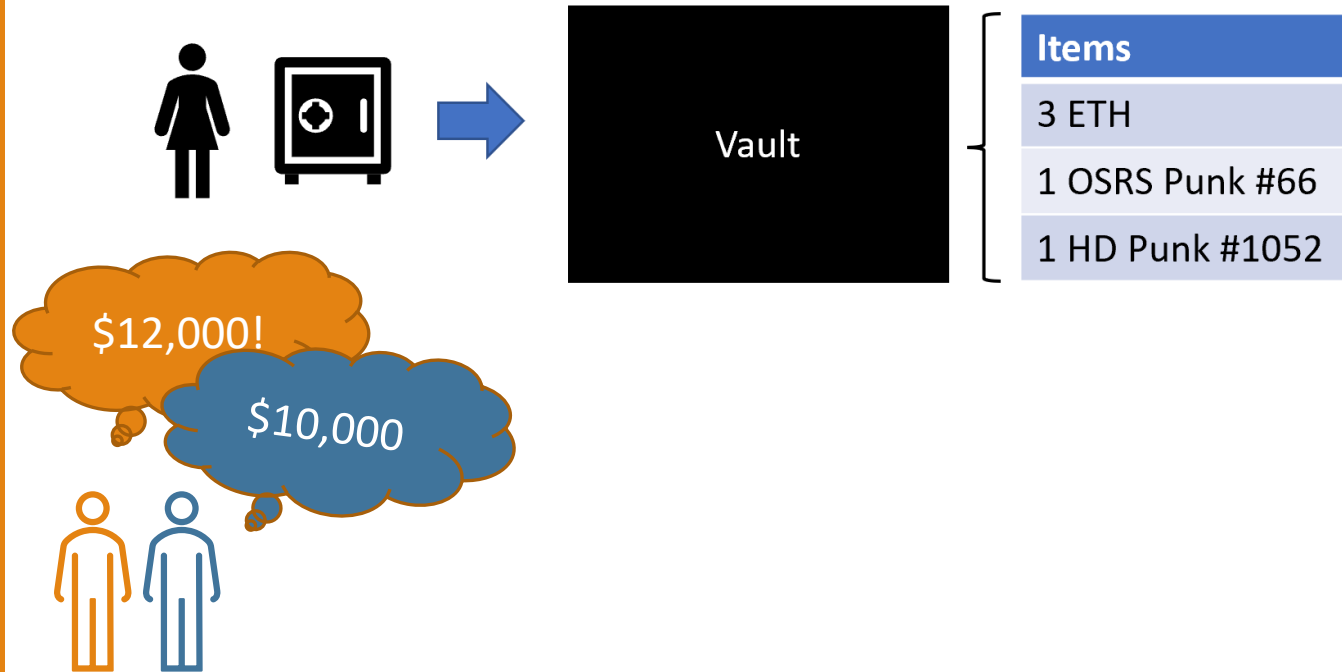
(Not just NFTs, any arbitrarily complex group of assets).



Mktplace

The Pitch

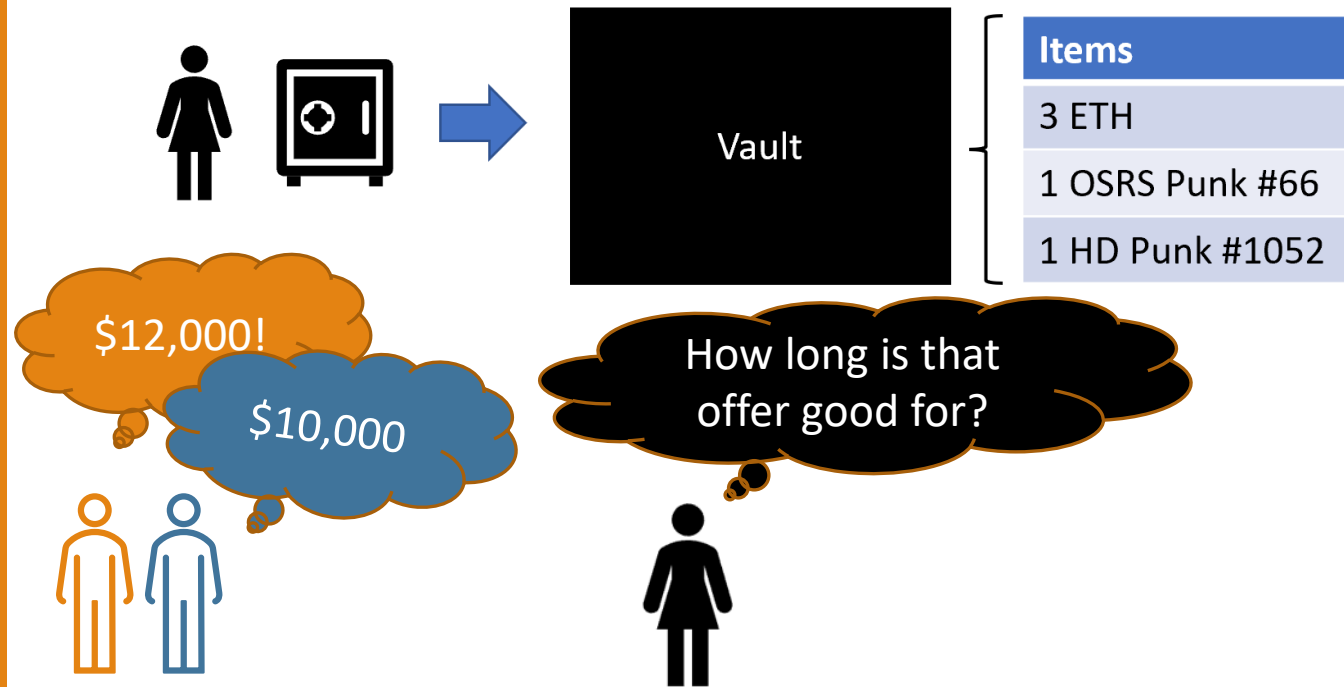
She publishes the vault
and people are
interested.



Mktplace

The Pitch

Mktplace adds a time-lock feature, turning all orders into limit orders.

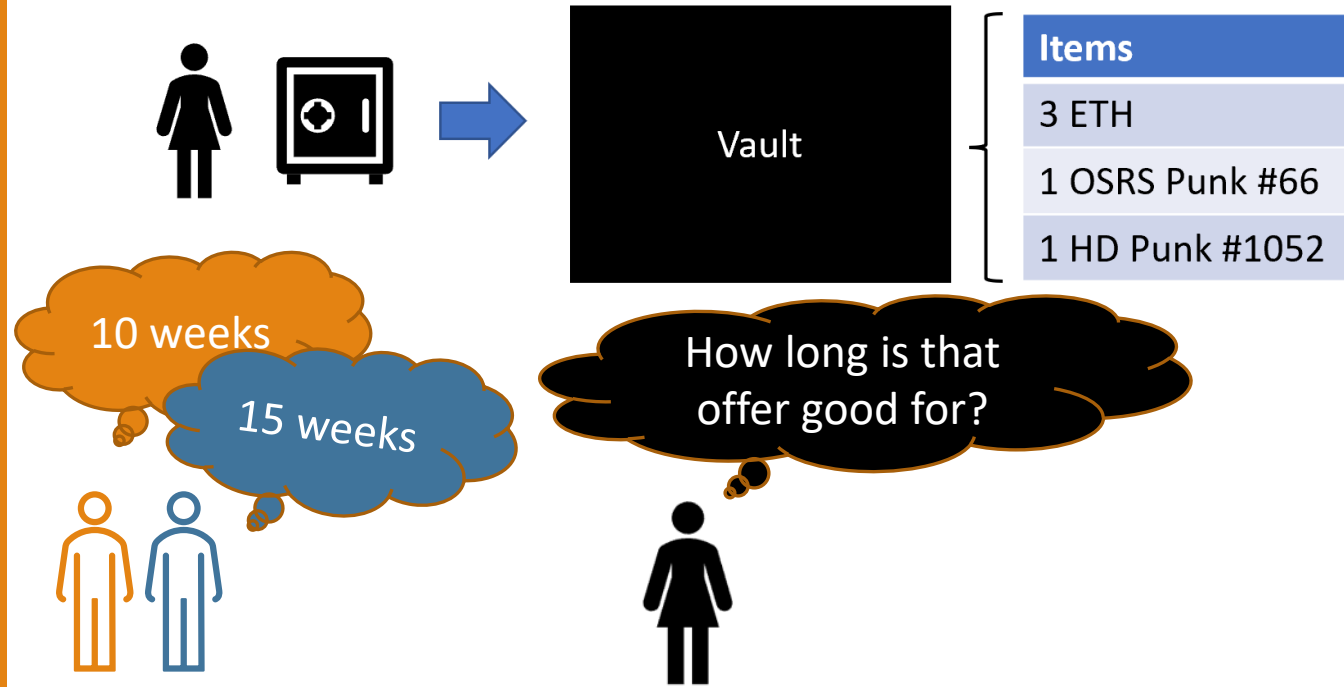


Mktplace

The Pitch

The bidders agree to lock their bid for their choice of weeks.

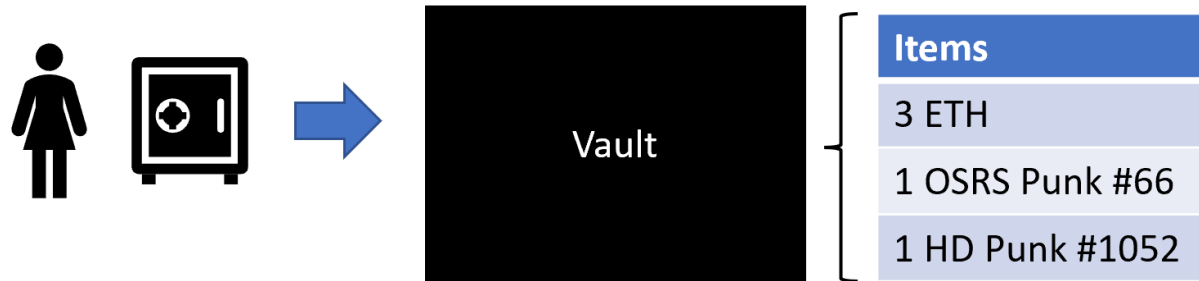
*This is the magic.



Mktplace

The Pitch

By agreeing to lock their bids, we turn their bid into a certificate of deposit.



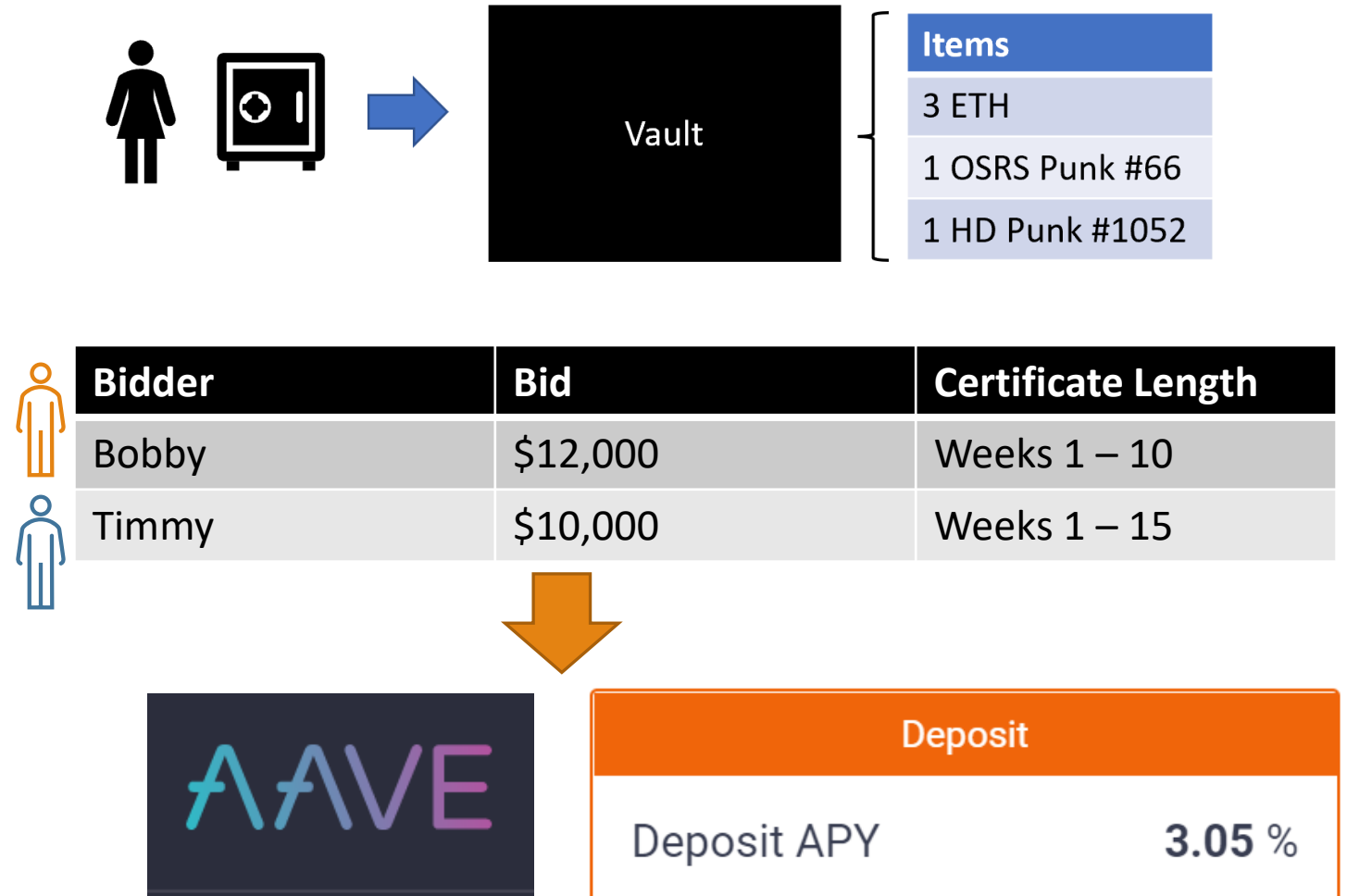
Bidder	Bid	Certificate Length
Bobby	\$12,000	Weeks 1 – 10
Timmy	\$10,000	Weeks 1 – 15

Mktplace

The Pitch

By agreeing to lock their bids, we turn their bid into a certificate of deposit.

And lock it into AAVE to earn interest.



Mktplace

The Pitch

Solves 3 Problems!

1. Yield incentivizes low-ball bids.
2. Low-ball bids give us a demand curve improving value estimation.
3. Alice can access debt through second party collateralization.



Getting yield while they hope to win Alice's Vault.



The bids gives her access to debt.

She can sell immediately OR use the bids to take a loan.

Credit Limit "Curve"

*Special checks happen here



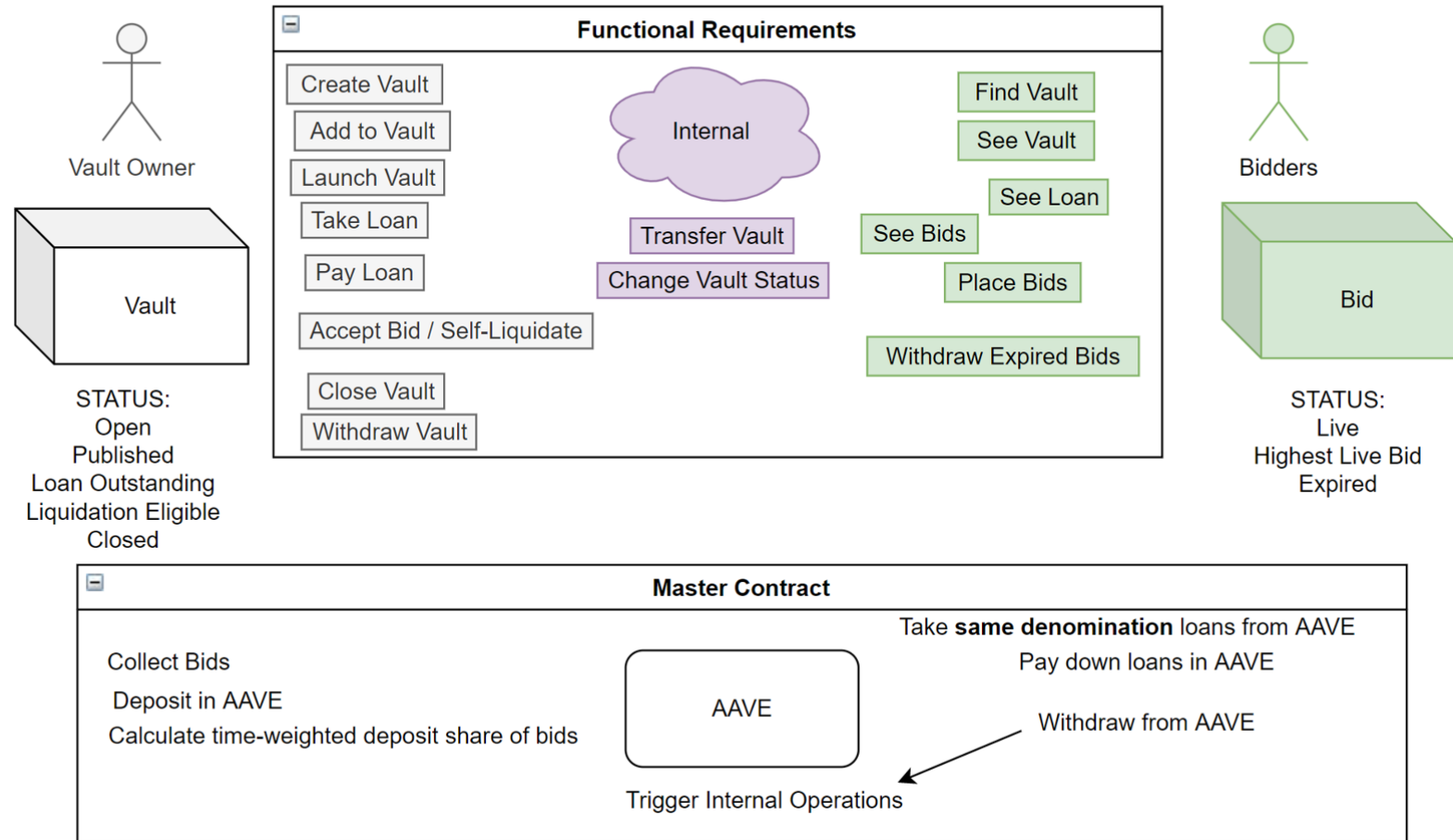
Variable borrowing	
Borrow APY	3.88 %

Weeks	Credit Limit
1	\$12,000
2	\$12,000
3	\$12,000
4	\$12,000
5	\$12,000
6	\$12,000
7	\$12,000
8	\$12,000
9	\$12,000
10	\$12,000
11	\$10,000
12	\$10,000
13	\$10,000
14	\$10,000
15	\$10,000
16	\$0

Mktplace

The Architecture

Mktplace, the decentralized pawn shop protocol.

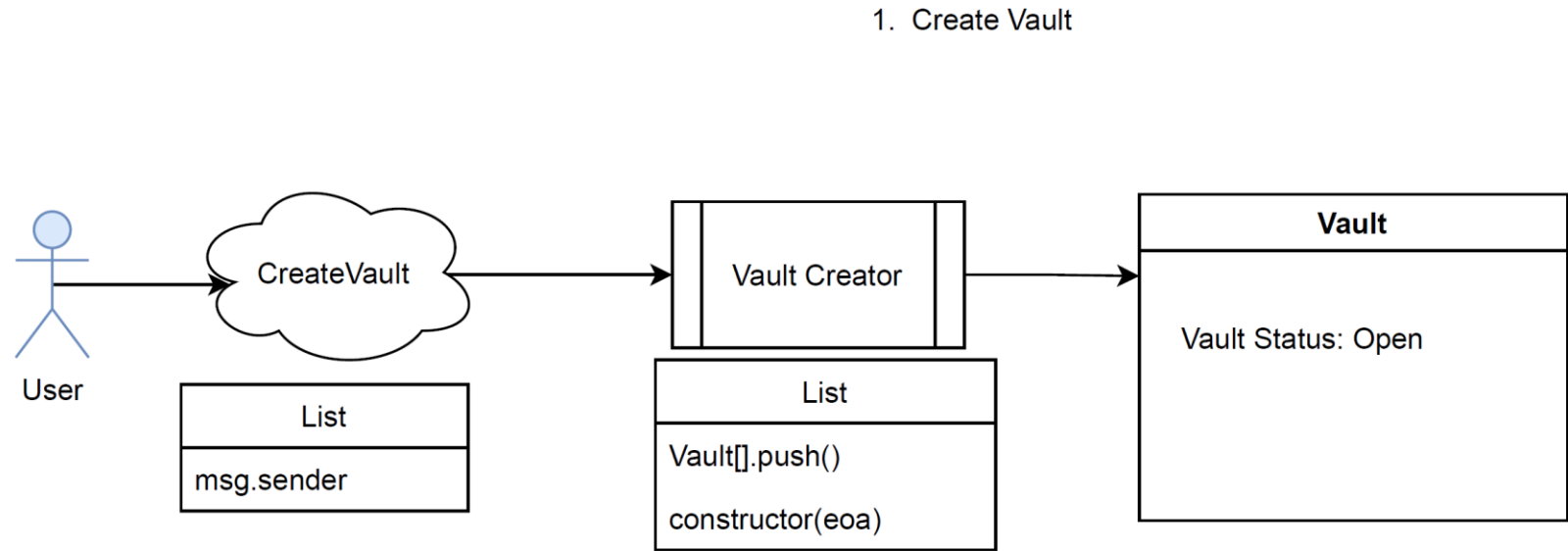


Mktplace

The Architecture

1. Users call Vault Creator to create a Vault with them as owner.

@Carlos

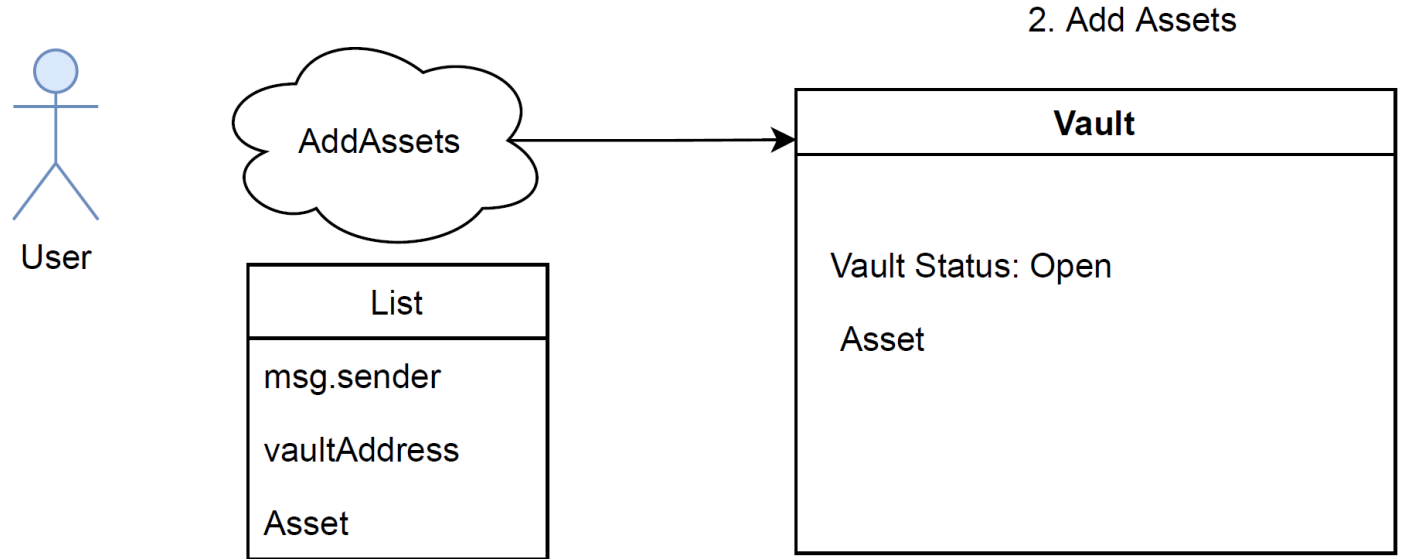


Mktplace

The Architecture

2. Users add Assets to their Vault.

@Maks



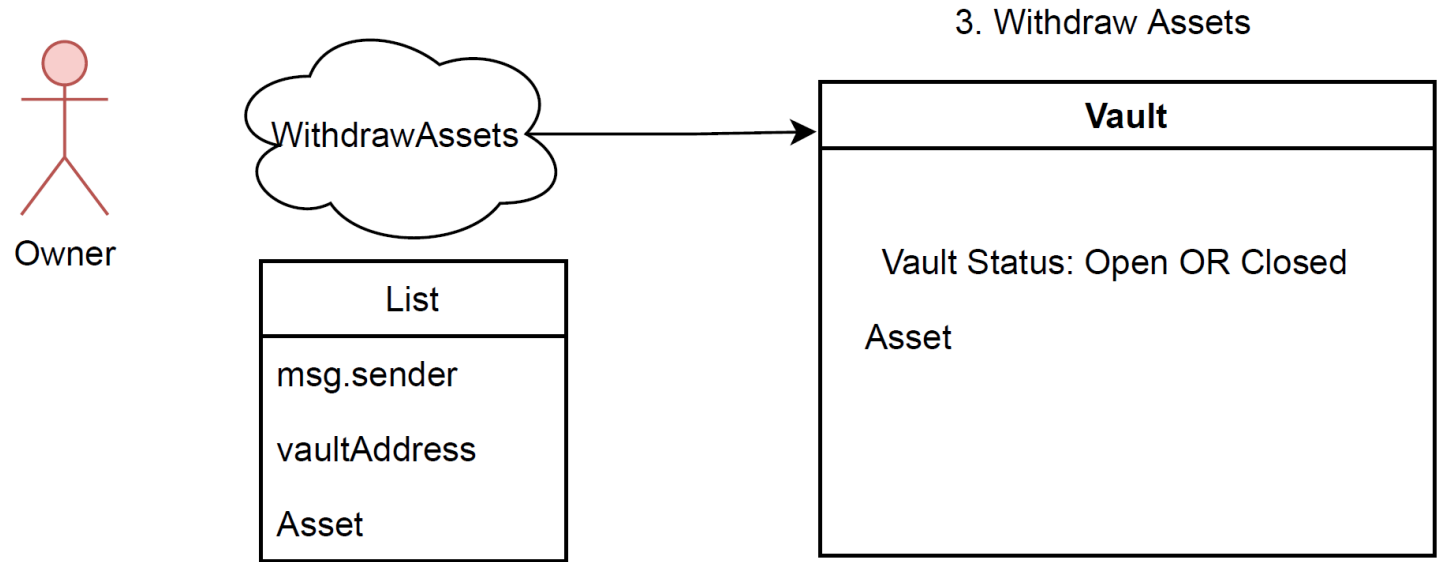
Mktplace

The Architecture

3. User can withdraw and change assets within a vault **prior to publication.**

@Maks

*subtle distinction between initial user of a vault and the owner of that vault (owner can change!).

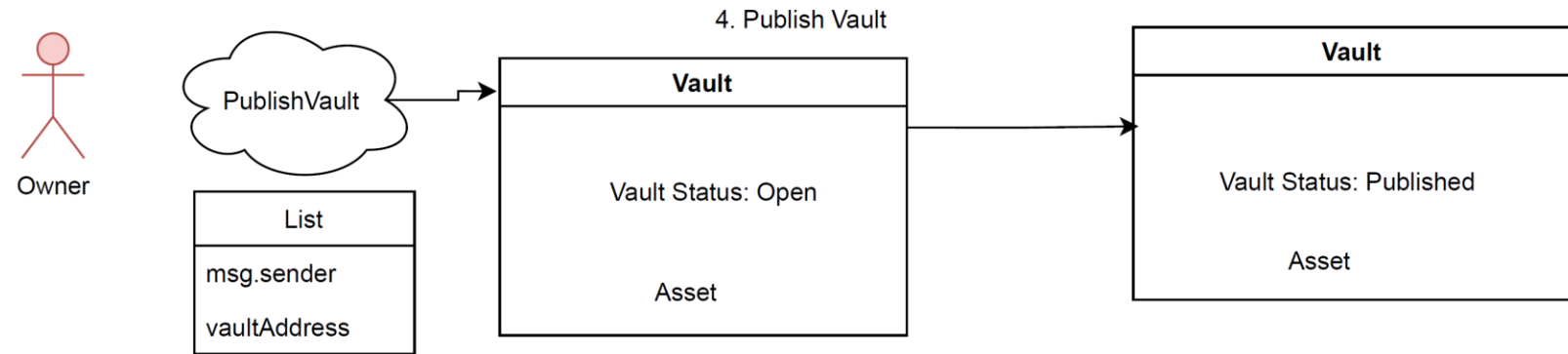


Mktplace

The Architecture

4. Owner publishes vaults when ready to accept bids.

@Josh

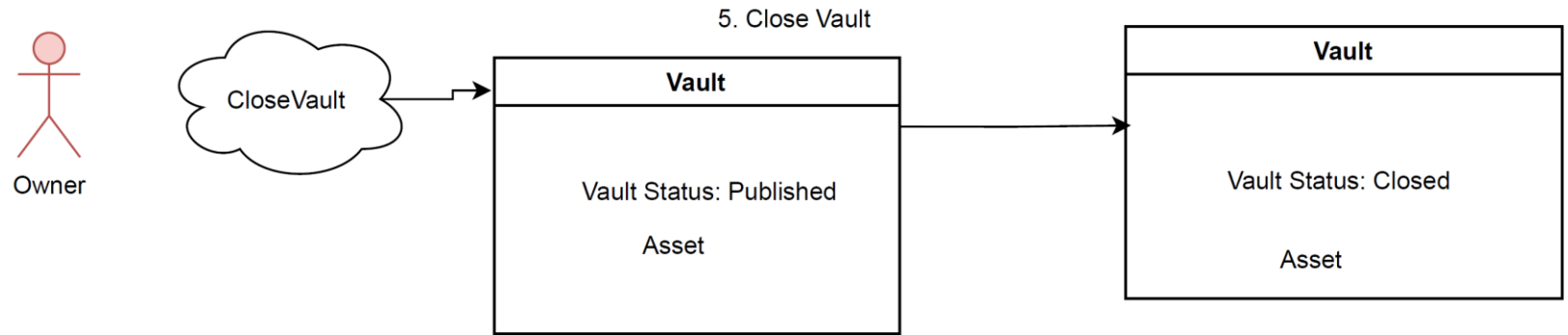


Mktplace

The Architecture

5. Owners can close vaults (*assuming they haven't taken any loans).

@Josh

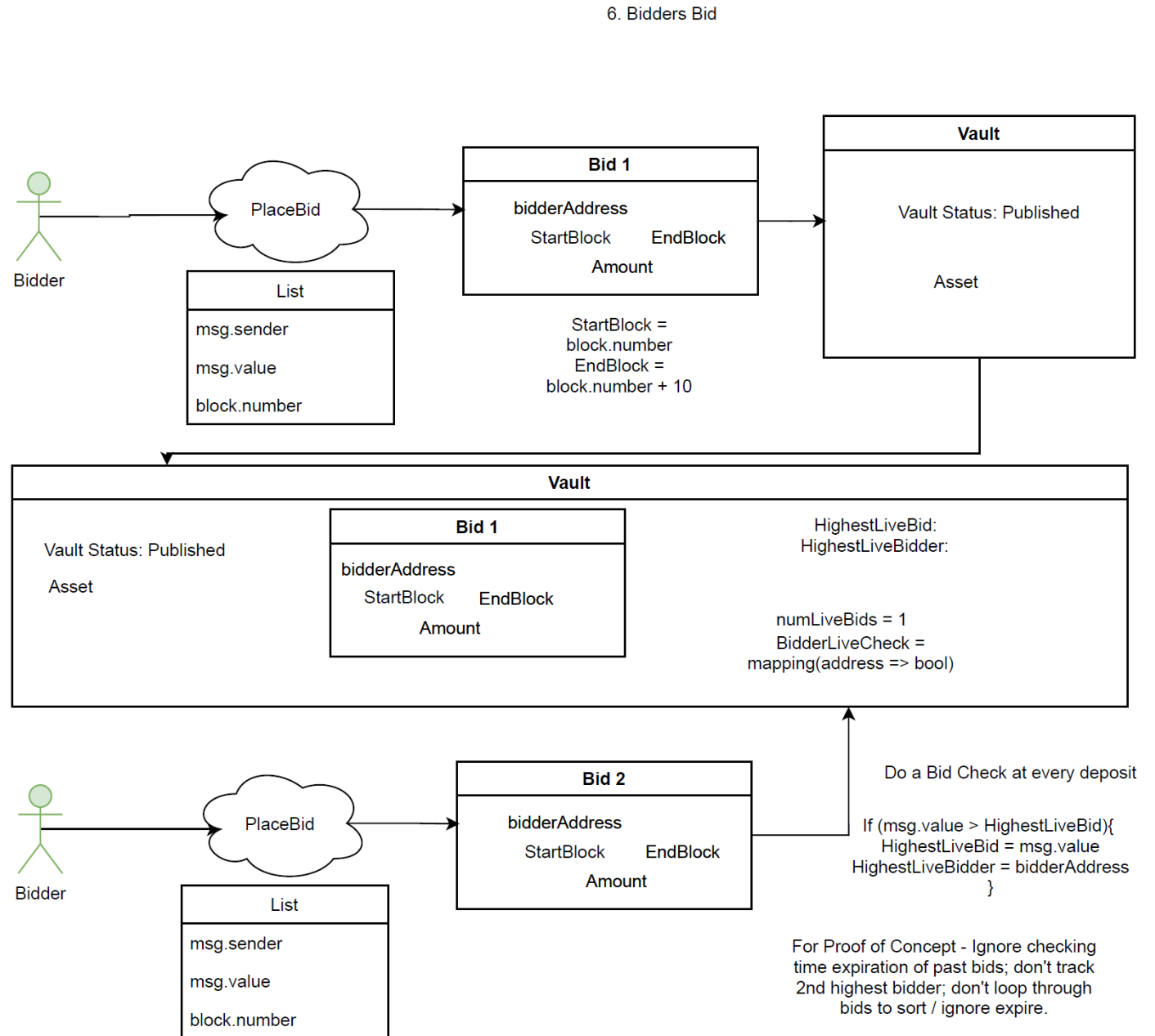


Mktplace

The Architecture

6. Bidders can submit time-locked bids (certain data is collected & stored).

@Marc



Mktplace

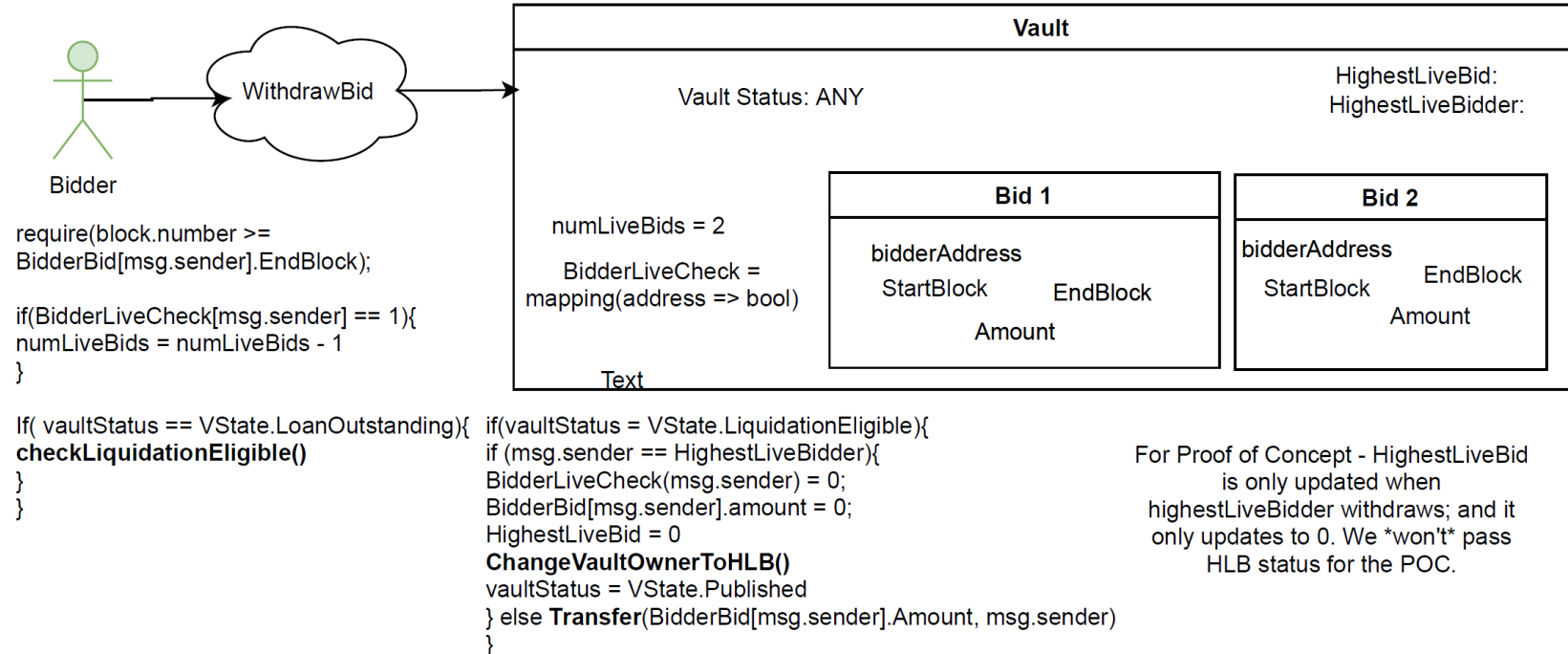
The Architecture

7. Bidders can withdraw their bids once they expire.

@Carlos

*Liquidation and other checks happen before they get the money though!

7. Bidder Requests Withdraw & related



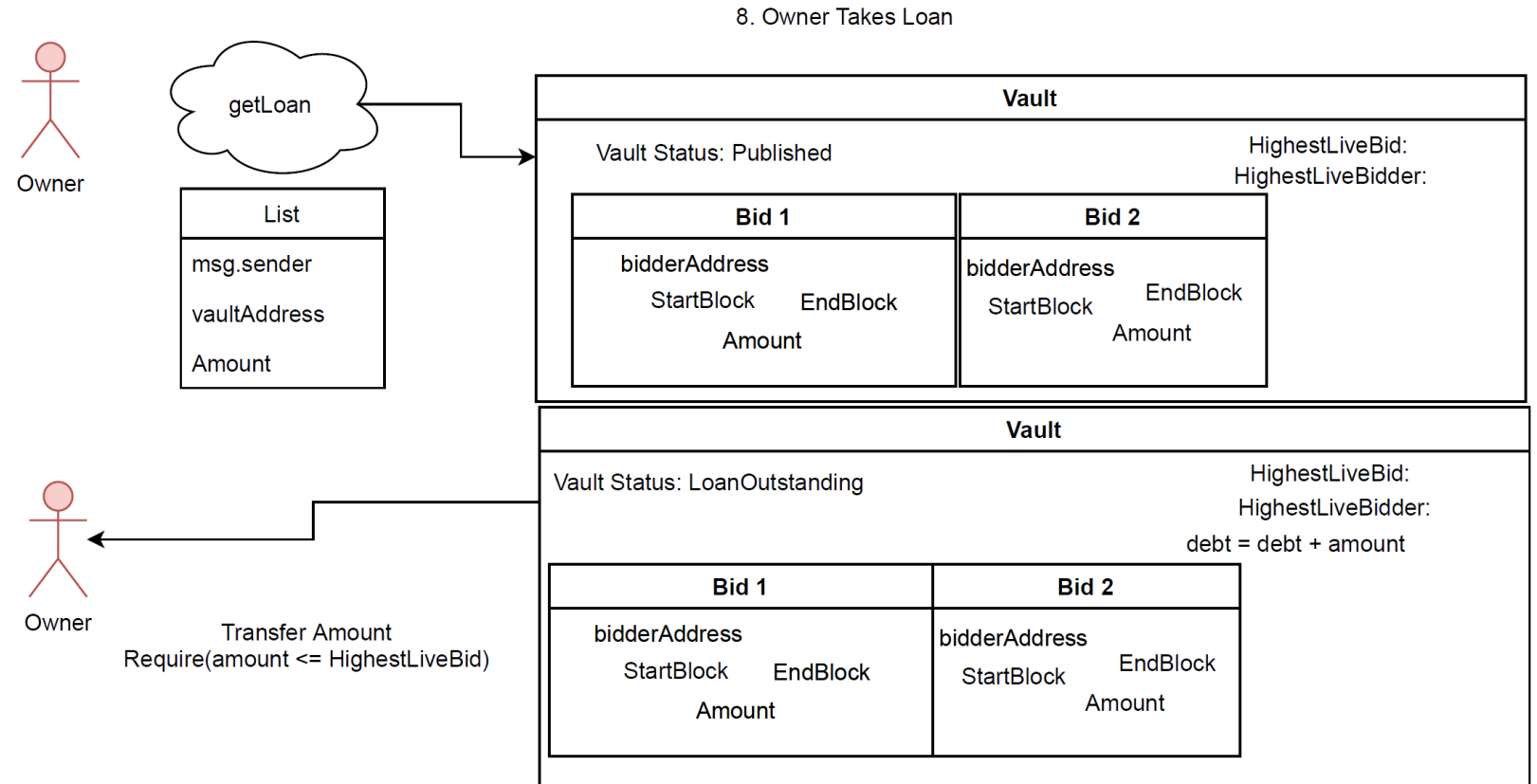
For Proof of Concept - HighestLiveBid is only updated when highestLiveBidder withdraws; and it only updates to 0. We *won't* pass HLB status for the POC.

Mktplace

The Architecture

8. Owners of Vaults can take a loan using bids as second-party collateral.

@Vivien

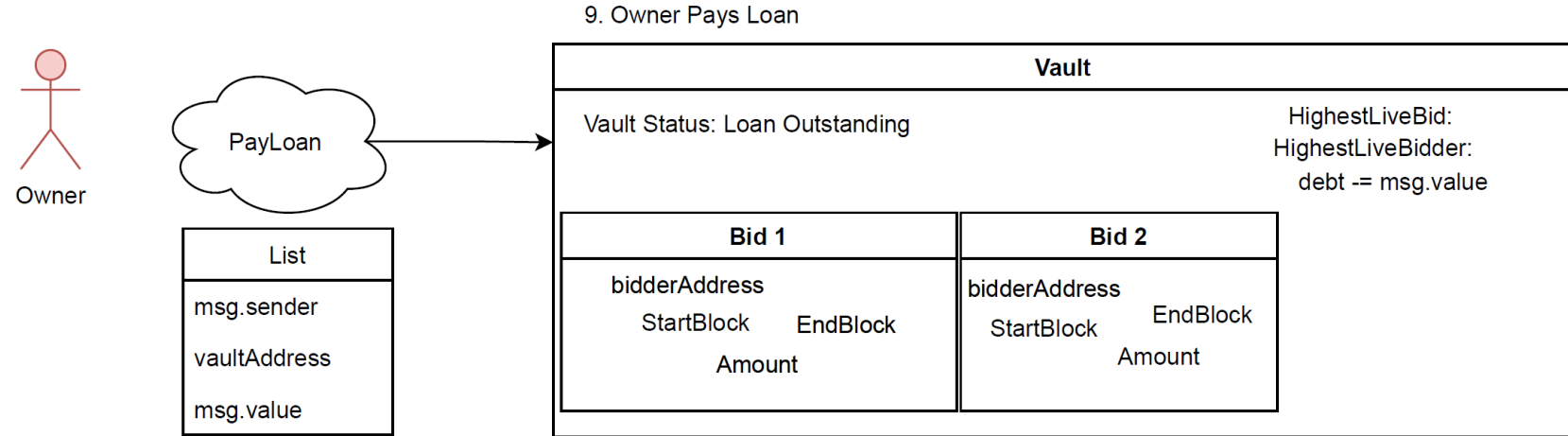


Mktplace

The Architecture

9. Owners of vaults can pay down their debt.

@Marc



Mktplace

Code Walkthrough

1. Vault Creator w/ createVault()

@Carlos

```
1  //SPDX-License-Identifier: GPL-3.0
2  pragma solidity ^0.8.0;
3
4  import "./mktplace.sol";
5
6  contract VaultCreator {
7      address public MktplaceAdmin; // public state variable automatically has getter function
8      Vault[] public deployedVaults; // public array automatically has getter function
9
10     constructor() {
11         MktplaceAdmin = msg.sender; // Contract Administrator, not new Vault owner
12     }
13
14     event CreateNewVault(string message);
15
16     /*1. User Makes a Vault*/
17     function createVault() public {
18         // pass caller to Vault constructor as eoa; makes them owner of a their Vault
19         Vault new_vault_address = new Vault(msg.sender);
20         deployedVaults.push(new_vault_address); // track these Vaults
21         emit CreateNewVault("New Vault Created");
22     }
23
24     // Carlos: made this, but not sure if we'll need it, was trying to test something
25     modifier OnlyMktplaceAdmin() {
26         require(
27             msg.sender == MktplaceAdmin,
28             "Only Mktplace Administrators can use this function"
29         );
30         _;
31     }
32 }
```


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Code Walkthrough

2. Users add Assets to their Vault.

@Maks

```
/*  
  Learned that NFTs cannot be approved & transferred within a function call!  
  
  notRun{  
    function AddAsset(address _nftAddress, uint256 _id) external OnlyOwner {  
      ERC721 NFT = ERC721(_nftAddress);  
      NFT.approve(address(this), _id);  
      NFT.safeTransferFrom(msg.sender, address(this), _id);  
    }  
  }  
*/
```



OpenSea

OpenSea to the rescue!

Mktplace

Code Walkthrough

3. Users can withdraw and change assets within a vault **prior to publication.**

@Maks

```
function WithdrawAsset(address _nftAddress, uint256 _id) external OnlyOwner {  
    ERC721 NFT = ERC721(_nftAddress);  
    NFT.safeTransferFrom(address(this), msg.sender, _id);  
}
```

Mktplace

Code Walkthrough

4. Users publish vaults when ready to accept bids.

@Josh

```
// 4. Publish Vault @ Josh
// Vault must be Open
// Optional: Vault must have stuff in it
function PublishVault() external OnlyOwner {
    require(
        vaultStatus == VState.Open,
        "Vault must be open to publish it."
    );
    vaultStatus = VState.Published;
}
```

Mktplace

Code Walkthrough

5. Owners of close vaults (*assuming they haven't taken any loans).

@Josh

```
// 5. Close a Vault @ Josh
// Vault must be Open OR Published
function CloseVault() external OnlyOwner {
    require(
        vaultStatus == VState.Open || vaultStatus == VState.Published,
        "Vault must be open or published to close it."
    );
    vaultStatus = VState.Closed;
}
```

Mktplace

Code Walkthrough

6. Bidders can submit
time-locked bids
(certain data is collected
& stored).

@Marc

```
// 6. Bidders Bid @ Marc
// need to read block metadata to create the Bid Struct and add it to the mapping
function placeBid() external payable {
    Bid memory newBid = Bid({
        bidderAddress: msg.sender,
        startBlock: block.number,
        endBlock: block.number + 10,
        amount: msg.value
    });

    BidderBids[msg.sender] = newBid;

    if (msg.value > highestLiveBid) {
        highestLiveBid = msg.value;
        highestLiveBidder = msg.sender;
    }
}
```

Mktplace

Code Walkthrough

7. Bidders can withdraw their bids once they expire.

*Liquidation and other checks happen before they get the money though!

```
// checkLiquidation Function
function checkLiquidationEligible(uint256 _debt) internal returns (bool) {
    require(
        vaultStatus == VState.LoanOutstanding,
        "No loans outstanding on this vault."
    );
    /*If there is debt, make vault LiquidationEligible*/
    if (_debt == 0) {
        vaultStatus = VState.Published;
        return (false);
    } else {
        vaultStatus = VState.LiquidationEligible;
        return (true);
    }
}
```

```
function changeVaultOwnerToHLB() internal {
    owner = payable(highestLiveBidder);
}
```

Mktplace

Code Walkthrough

7. Bidders can withdraw their bids once they expire.

*Liquidation and other checks happen before they get the money though!

```
// Withdraw Bid
function withdrawBid() public {
    require(
        block.number >= BidderBids[msg.sender].endBlock,
        "Your bid has not expired."
    );
    require(
        BidderBids[msg.sender].amount > 0,
        "You do not have a bid to withdraw."
    );

    // If there's a loan out, check for liquidation eligibility
    if (vaultStatus == VState.LoanOutstanding) {
        checkLiquidationEligible(debt);
    }

    if (vaultStatus == VState.LiquidationEligible) {
        // If liquidated by highestLiveBidder, keep the money and give them the vault
        if (msg.sender == highestLiveBidder) {
            BidderBids[msg.sender].amount = 0;
            highestLiveBid = 0;
            debt = 0;
            changeVaultOwnerToHLB();
            vaultStatus = VState.Published;

            // if liquidated by anyone else, they can withdraw just fine
        } else {
            uint256 value = BidderBids[msg.sender].amount;
            address payable recipient = payable(msg.sender);
            BidderBids[msg.sender].amount = 0;
            recipient.transfer(value);
        }
    }
}
```

```
    }
    // If vault does not have a loan / is not liquidation eligible, withdraw their money
    // NOTE: this should check for 2nd highest loan and update highestLiveBidder & highestLiveBid but
    // skipping that for proof of concept.
} else {
    uint256 value = BidderBids[msg.sender].amount;
    address payable recipient = payable(msg.sender);
    BidderBids[msg.sender].amount = 0;
    recipient.transfer(value);
}
}
```

Mktplace

Code Walkthrough

8. Owners of Vaults can take a loan using bids as second-party collateral.

@Vivien

*for proof of concept, they take max loan possible.

```
event LoanTransferred(  
    address indexed _borrower,  
    address indexed _lender,  
    uint256 indexed _value  
);  
  
function getLoan() external OnlyOwner {  
  
    require(  
        vaultStatus == VState.Published,  
        "Only published vaults can take loans."  
    );  
  
    require(  
        highestLiveBid != 0,  
        "There are no bids for your vault."  
    );  
  
    //update statuses  
    debt += highestLiveBid;  
    vaultStatus = VState.LoanOutstanding;  
  
    //transfer loan  
    address payable recipient = payable(msg.sender);  
    recipient.transfer(highestLiveBid);  
  
    emit LoanTransferred(msg.sender, highestLiveBidder, highestLiveBid);  
}
```


Mktplace

Code Walkthrough

9. Owners of vaults can
pay down their debt.

@Marc

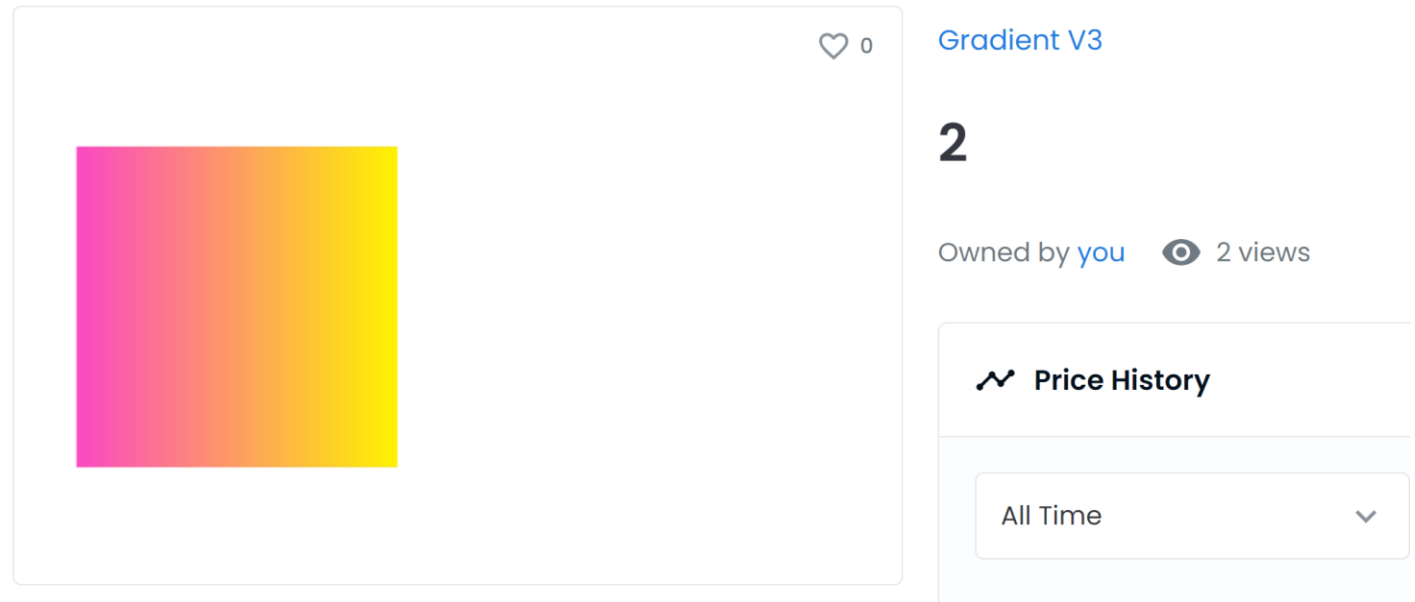
```
// 9. Owner Pays loan - @ Marc
// Require Vault be status LoanOutstanding
// reduce debt as needed
// Change to Published IF ALL debt is paid
function payLoan() payable external OnlyOwner {
    require(vaultStatus == VState.LoanOutstanding, "There is no loan to pay back.");

    if (msg.value >= debt) {
        vaultStatus = VState.Published;
        debt = 0;
    } else {
        debt -= msg.value;
    }
}
```

Mktplace

Demo

Our Testnet NFT,
Gradient V3



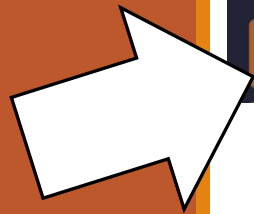
URL

<https://testnets.opensea.io/assets/0x48fe3c3fcdcfca7b0b9513fff47e1b3b3b9de491/6>

Mktplace

Demo

Launching a Vault with Carlos's Rinkeby wallet.



ENVIRONMENT

Injected Web3

Rinkeby (4) network

ACCOUNT +

0x39E...D06BB (19.234445)

GAS LIMIT

3000000

VALUE

0

wei

CONTRACT

Vault - contracts/Mktplace.sol

Deploy

0x39E856863e5F6f0654a0t



Rinkeby Testnet Network

Contract 0x9131f9D591891f88B7c03c67D480b4E872Fe227a

Our deployed contract address

Transaction Hash

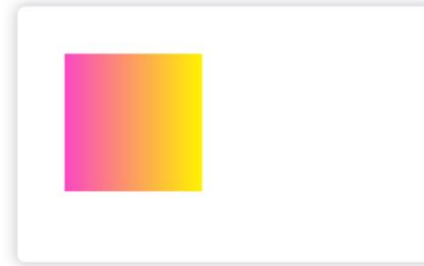
<https://rinkeby.etherscan.io/tx/0xc470f2a709cb29a4970f86dc75afa4b1a4c04f0583df54fb3c8baf1a73833376>

Mktplace

Demo

Using OpenSea to
approve & transfer our
NFT.

Transfer



Wallet Address or ENS Name

0x9131f9D591891f88B7c03c67D480b4E872Fe227d

"2" will be transferred to 0x9131f9D591891f88B7c03c67D480b4E872Fe227a

Transfer

? Tokens Transferred:

► From 0x39e856863e5f6f... To 0x9131f9d591891f... For ERC-721 TokenID [6] Gradient (GRD)

Transaction Hash

<https://rinkeby.etherscan.io/tx/0xe821c2e9ec8e3fdc2fc90e2c85248695551816474e864661b5e6527abdba616f>

Mktplace

Demo

Bidder (Account 2)
places a bid.

ENVIRONMENT

Injected Web3

Rinkeby (4) network

ACCOUNT +

0xC30...68fB6 (14.0232515)

GAS LIMIT

3000000

VALUE

1

ether


placeBid

Account 2

0x9131...227a

https://remix.ethereum.org

PLACE BID

 1

DETAILS DATA

EDIT

remix.ethereum.org 0.000155 **0.000155 ETH**

suggested gas fee

Maybe in 30 seconds

Max fee: 0.000155 ETH

Total 1.000155 **1.000155 ETH**

Amount + gas fee Max amount: 1.000155 ETH

Reject Confirm

Transaction Hash

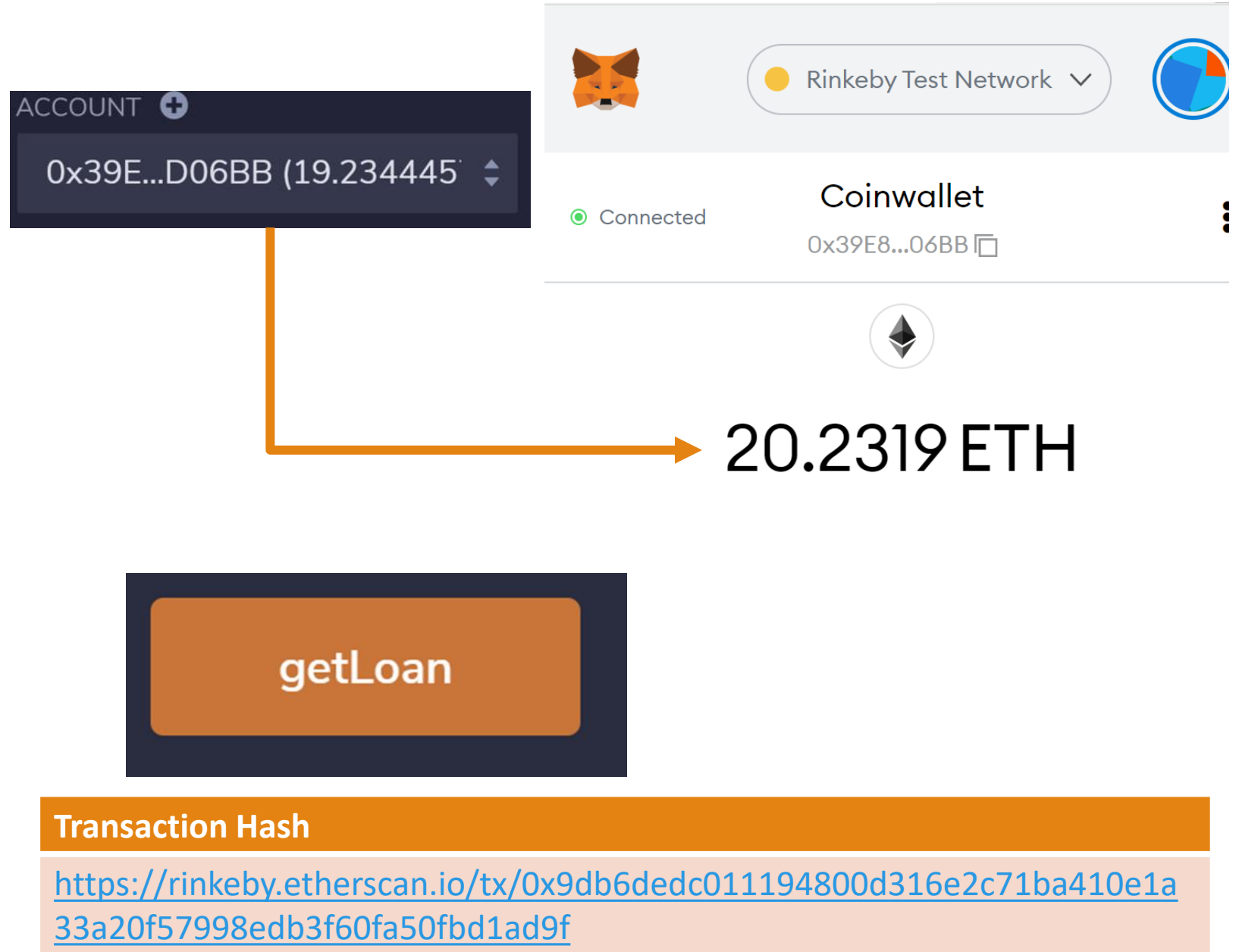
<https://rinkeby.etherscan.io/tx/0xa8cd53dd27d2b5c8c9f6c80158b1224a1499e29c84b9a333bb61d3c948173c2d>

Mktplace

Demo

Take a loan.

For the proof of concept, it takes the maximum.

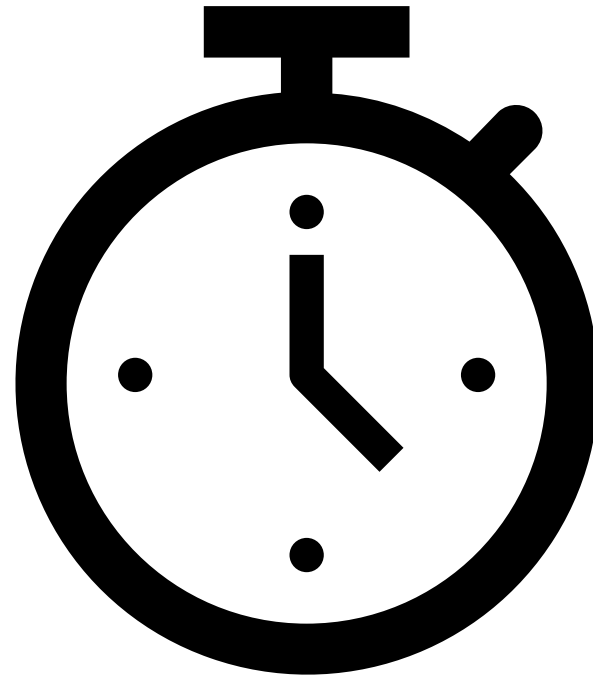


Mktplace

Demo

Don't pay the loan.

Wait 10 blocks until bid
expires.



Mktplace

Demo

Bidder withdraws their bid, but because the debt was not paid- instead of receiving their money- the vault is liquidated, making the bidder the new owner.

owner

0: address: 0x39E856863e5F6f0654a0b87B12bc921DA23D06BB

withdrawBid

owner

0: address: 0xC309C45963a392281ACE5b19cf8C355A77368fB6

debt

0: uint256: 0

Withdraw Bid

Details

From: 0xC309C45963a3... > To: 0x9131f9D591891f88B...

Transaction	
Nonce	8
Amount	-0 ETH
Gas Limit (Units)	54404
Gas Used (Units)	41791
Base fee (GWEI)	0.000000013
Priority fee (GWEI)	1
Total Gas Fee	0.000042 ETH
Total	0.000042 ETH

Transaction Hash

<https://rinkeby.etherscan.io/tx/0x2aea707af27c7db0b98cefd6389547867cfc b225cb65e525c5351a6b47ecbe63>

Mktplace

Demo

Bidder withdraws the NFT from their new vault!

For proof of concept, they directly identify the NFT by address & ID.

testnets.opensea.io/assets/0x48fe3c3fcdcfca7b0b9513fff47e1b3b3b9de491/6

WithdrawAsset

9513fff47e1b3b3b9de491,6

Gradient V3

2

Owned by C309C4 2 views

Make offer

Event

Price

From

To

↔ Transfer

9131F9

C309C4

↔ Transfer

you

9131F9

② Tokens Transferred:

▶ From 0x9131f9d591891f... To 0xc309c45963a39... For ERC-721 TokenID [6] Gradient (GRD)

Transaction Hash

<https://rinkeby.etherscan.io/tx/0xc1bf53f8a5b544de83097fe86e1888484a907196e04cc80fed341c11ca5298a7>

Mktplace - Thank you!

CARLOS MERCADO | JOSH MITCHELL | MAKS PAZUNIAK | VIVIEN CHEN | MARC BENNET

SPECIAL THANKS TO: PREETHI KASIREDDY, SAMEE SIDDIQUI, JULIAN MARTINEZ

