

An abstract composition on a dark gray background. It features several diagonal lines: a white line in the upper left, a light gray line in the lower left, and a bright pink line in the lower right. The word 'Substrate' is written in a bold, orange, sans-serif font, positioned between the white and light gray lines. The word 'River' is written in the same font and color, positioned between the light gray and pink lines.

Substrate

River

Kitty Auction-004

Finalizing an auction

<https://substrate.dev/substrate-collectables-workshop/#/Extras/Auction/finalizing-an-auction>



Finalizing an auction - 结束竞拍

在`decl_module !`中可以使用一个名为`on_finalize()`的特殊函数，该函数用于需要在**代码块结束时**执行的任何操作。我们可以使用它来结束一个过期时间等于当前块号的拍卖。

请记住，我们可能有多个将在给定块号处过期的拍卖，因此我们将从存储中检索将在当前块处过期的所有拍卖。

```
let auctions = Self::auctions_expire_at(<system::Module<T>>::block_number());
```



on_finalize:逻辑

- 1- 检查Kitty的所有者，确保竞拍成功者不是Kitty的所有者
- 2- 中标者的保留余额将使用unreserve函数释放。
- 3- 将中标者的最终出价支付给kitty所有者。
- 4- 把这只猫从它的所有者手中移交给出价最高的中标者
- 5- 清除存储信息： <Bids>, <BidAccounts>, <KittyAuction>, and <Auctions>
- 6- 使用unreserve功能，释放未中标者的代管金额。



Bounding loops while finalizing a block: 循环问题

如果让链上的用户创建任意数量的拍卖，这些拍卖将以某个块结束，那么所有这些拍卖将在`on_finalize()`函数中循环。这是一个攻击向量，它可以阻止你的链。

因此，你应该通过限制以一个区块结束的拍卖的数量来防止这种可能性。所以你应该做以下事情：

- 1- 添加一个常量`MAX_AUCTIONS_PER_BLOCK`来限制每个块的拍卖次数。
- 2- 确保将在目标块中结束的拍卖数量不超过限额。



Your Turn!

`on_finalize()`



Manual Tests

Create an auction for a kitty.

为Kitty创建一个拍卖

Create bids for this auction from other accounts.

用另一个账号，为拍卖品创建一个竞拍

Check if bidder's bid amount is reserved and the bid is recorded in Bids. Also check if the reserved balance is increased correctly as the same bidder increases the bid (the reserve balance should be equal to the latest bid amount of the account).

检查竞拍者的出价是否被代管，当拍卖者再次进行拍卖的情况下，检查代管出价是否增加了。

Check if the auctioned kitty is sold to the high bidder for the high bid when the auction is finalized (high bidder should be the new owner, and the previous owner and bidder balances should be updated).

拍卖结束时，拍卖的Kitty是否被转移给最高的出价者。

Check if the losing bidders' reserved balances are freed.

检查所有的代管代币是否被释放



备注存储相关内容

KittyAuction get(auction_of): map T::Hash => Option<Auction<T::Hash, T::Balance, T::BlockNumber, T::AccountId>>;

Auctions get(auctions_expire_at): map T::BlockNumber => Vec<(Auction<T::Hash, T::Balance, T::BlockNumber, T::AccountId>>;

AuctionPeriodLimit get(auction_period_limit) config(): T::BlockNumber = T::BlockNumber::sa(17280);

Bids get(bid_of): map (T::Hash, T::AccountId) => T::Balance;

BidAccounts get(bid_accounts): map T::Hash => Vec<T::AccountId>;



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Thanks