EIP-4337: DynamicNFT Extension - Account Abstraction for Gasless Minting

Introduction

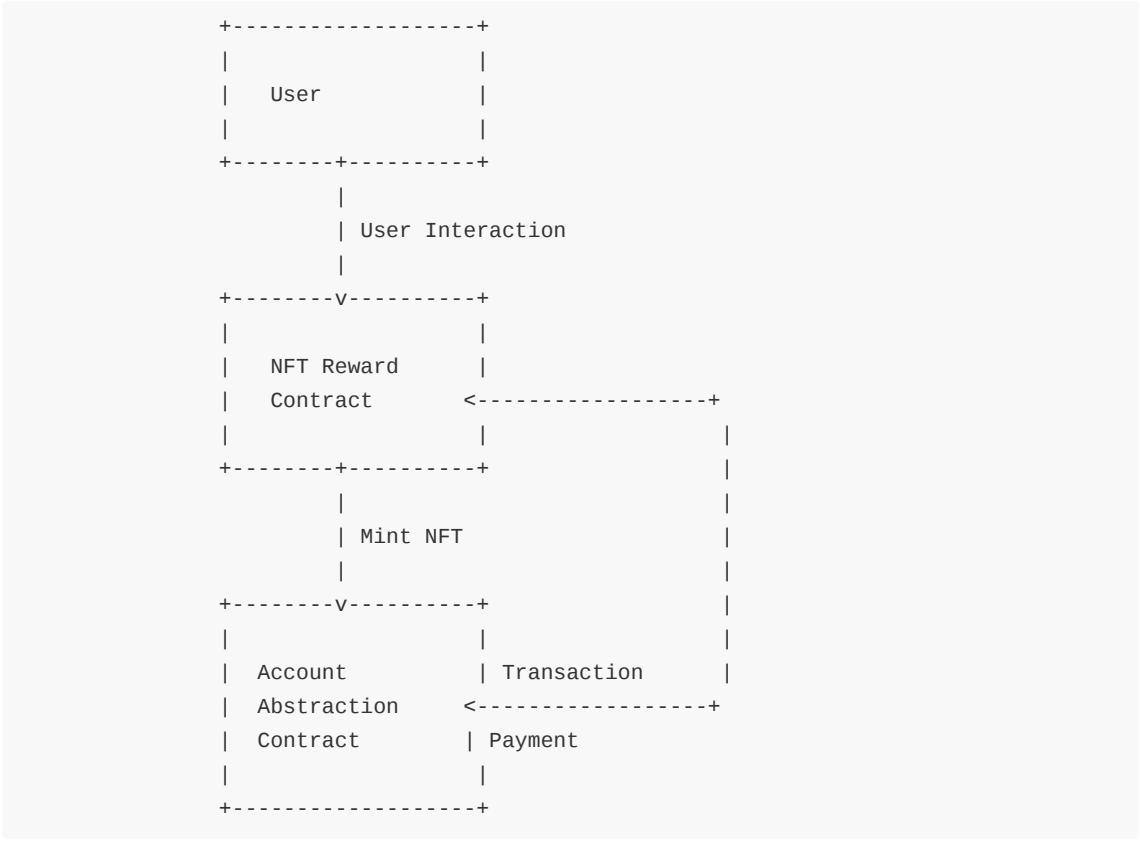
In this document, we will outline the technical specifications for integrating EIP-4337 functionality into the NFT reward system developed for Boonty. EIP-4337, also known as "Account Abstraction," aims to streamline user onboarding processes for clients by abstracting away the need for users to have an Ethereum account or fund it with gas before minting NFT rewards.

Objective

The primary objective of this upgrade is to enhance user experience and simplify the process of minting NFT rewards for Boonty's clients. By implementing EIP-4337, users will no longer need to possess an Ethereum account or worry about gas fees, thereby reducing friction and increasing participation in reward programs.

Technical Specification

1. Integration of EIP-4337 Functionality
    - Overview: EIP-4337 introduces the concept of account abstraction, allowing contracts to pay for transaction fees on behalf of users.
    - Implementation: Modify the existing NFT reward smart contract to utilize account abstraction for covering gas fees during NFT minting.
    - Benefit: Eliminates the need for users to have an Ethereum account or Ether balance, simplifying the onboarding process and improving user engagement.
2. Interaction with Existing Contracts
    - NFT Reward Contract: The NFT reward contract will be updated to include functions for interacting with the account abstraction contract.
    - Account Abstraction Contract: A new contract implementing EIP-4337 functionality will be deployed and integrated with the NFT reward contract.
3. User Onboarding Flow
    - User Interaction: Users will interact with the NFT reward contract as usual, initiating the minting process without requiring an Ethereum account.
    - Gas Fee Coverage: The account abstraction contract will handle gas fee payments on behalf of users, abstracting away the complexity of Ethereum transactions.
4. Architectural Diagram
    - The diagram illustrates the interaction between the NFT reward contract, the account abstraction contract, and user interactions.
    - Users initiate the minting process through the NFT reward contract, which interfaces with the account abstraction contract to cover gas fees.
    - Upon successful minting, the NFT is transferred to the user's wallet address.



5. Pseudo Code Pseudo code demonstrating interaction with account abstraction contract

```
contract NFTReward {
 AccountAbstraction public accountAbstraction;

 constructor(address _accountAbstraction) {
     accountAbstraction = AccountAbstraction(_accountAbstraction);
 }

 function mintNFT(address _recipient, uint256 _tokenId) external {
     // Perform checks and validations

     // Call account abstraction contract to cover gas fees
     accountAbstraction.payGasFees();

     // Mint NFT to recipient
     _mint(_recipient, _tokenId);
 }
}
```

```
contract AccountAbstraction {
 function payGasFees() external {
     // Logic to cover gas fees
 }
}
```

Conclusion

By implementing EIP-4337 functionality into the NFT reward system, Boonty will significantly enhance user onboarding processes, making it easier for clients to offer NFT rewards to their consumers. This technical upgrade aligns with Boonty's commitment to innovation and user-centric solutions in the blockchain space.