

ERC20 Tokens - allowed, transferFrom() and approve()

- **transfer()** function is used to send tokens from one user to another, but it doesn't work well when tokens are being used to pay for a function in a smart contract;
- **ERC20** standard defines a mapping data structure named **allowed** and 2 functions **approve(...)** and **transferFrom(...)** that permit a token owner to **give another address approval to transfer up to a number of tokens** known as **allowance**;
- Allowances for an address can only be set by the owner of that address;

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Imagine there are 2 users **A** and **B**. **A** has 1000 tokens and wants to give permission to **B** to spend 100 of them.

1. **A** will call `approve(address_of_B, 100)`. After that the `allowed` data structure will contain the following information: `allowed[address_of_A][address_of_B] = 100`
2. If **B** wants later to transfer 20 tokens from **A** to his account, **B** will execute the `transferFrom()` function in this way: `transferFrom(address_of_A, address_of_B, 20)`.

After calling the `transferFrom()` function (by **B**) the balance of **A** decreased by 20 and the balance of **B** increased by 20 tokens and the `allowed` mapping will contain the following info: `allowed[address_of_A][address_of_B] = 80`