

ERC20 Specification

- Functions & Events

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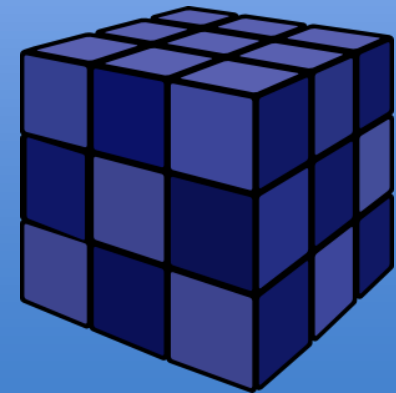
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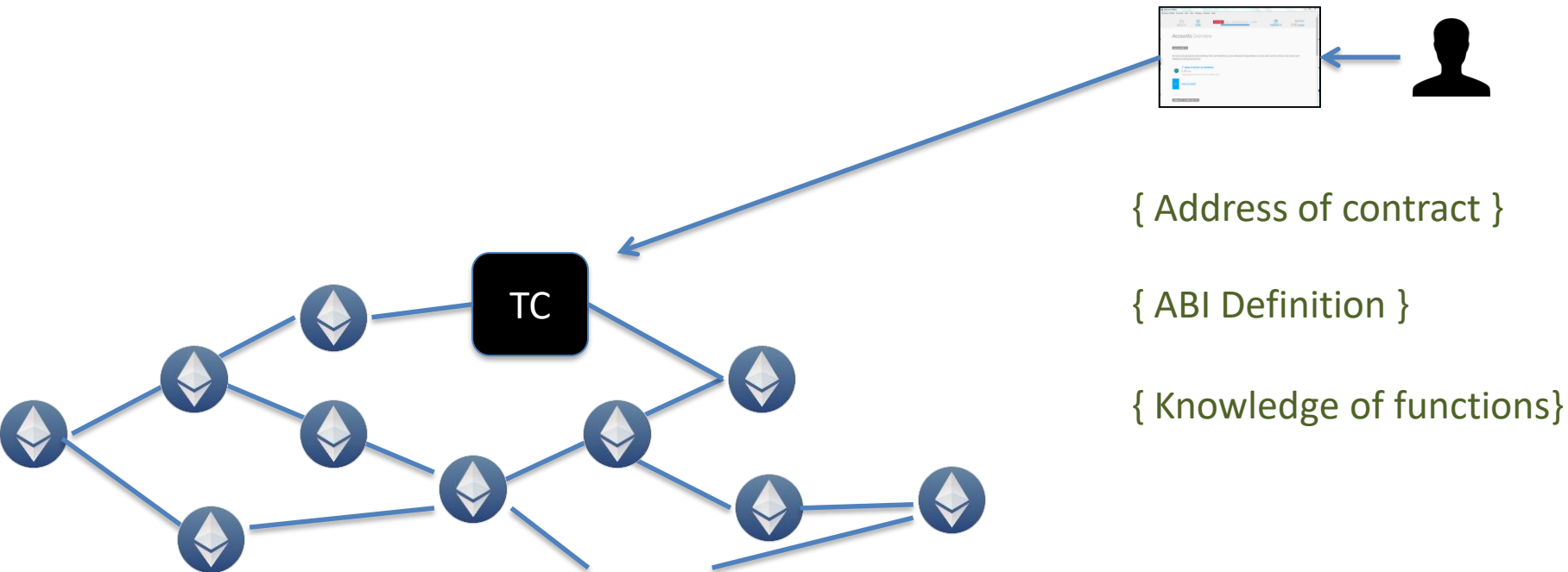
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This deck is part of a online course on [“Ethereum: Design and Development of Decentralized Apps.”](#)

Token Contract

- Tokens managed by a *Smart Contract*
 - Manages balances
 - Transfers
 - Rules



- Specification for creating custom tokens
 - Defines a set of functions : name, return & args are fixed
 - Defines a set of events

NOT a Technology

NOT a Software

NOT a Piece of code

ERC20 Compliance

Functions

Token Contract

```
function totalSupply() constant returns (uint256 totalSupply)
```

- May support minting of new tokens
- May support reducing the token supply

```
function balanceOf(address _owner) constant returns (uint256 balance)
```

- Returns the balance in tokens, held by the `_owner`

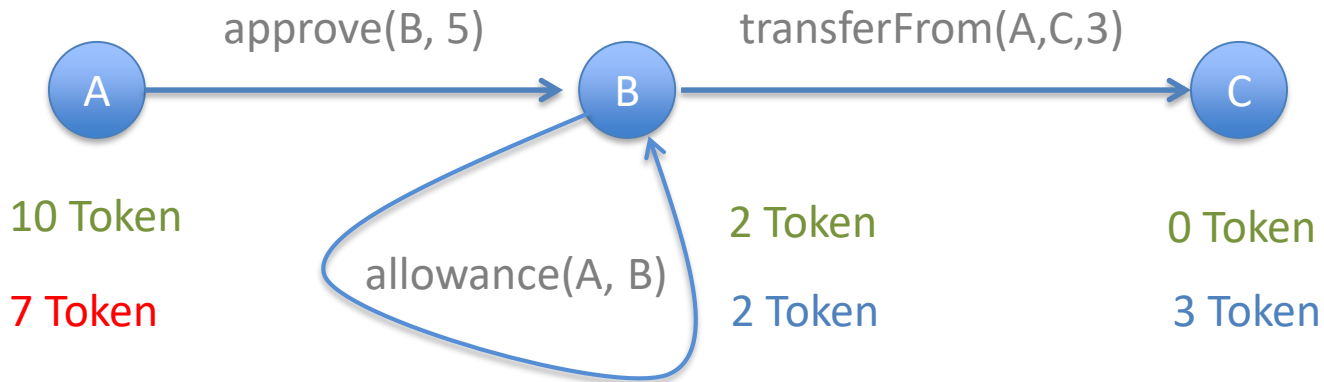
```
function transfer(address _to, uint256 _value) returns (bool success)
```

- Caller transfers ownership to the address `_to`

ERC20 Compliance

Functions

Token Contract



```
function approve(address _spender, uint256 _value) returns (bool success)
```

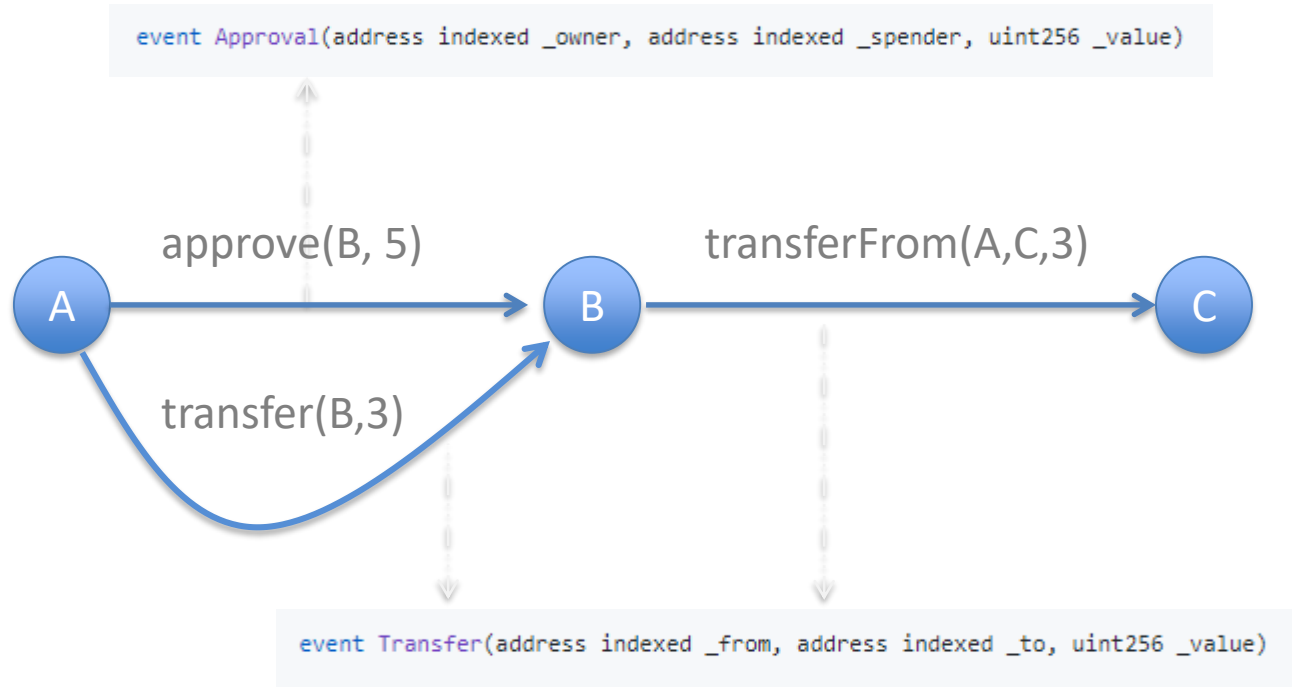
```
function allowance(address _owner, address _spender) constant returns (uint256 remaining)
```

```
function transferFrom(address _from, address _to, uint256 _value) returns (bool success)
```

ERC20 Compliance

Events

Token Contract



ERC20 Compliance

Token Contract

- Support additional/custom function & events
 - Token administration activities
 - E.g., `function removeTokens(uint256 x)`
 - E.g., `event TokensRemoved(uint256 x)`

Crowdfunding

- There are rules/policies
 - Max tokens that can be owned by any account < 49%
 - Every 10 tokens = 1 Vote
 - Initial Token sale will close on certain date

Token
Contract

- Contains the rules

Crowd
Sale



Token
Contract

- Separate contracts

ERC20 Sample

- Refer to code in Github Repo

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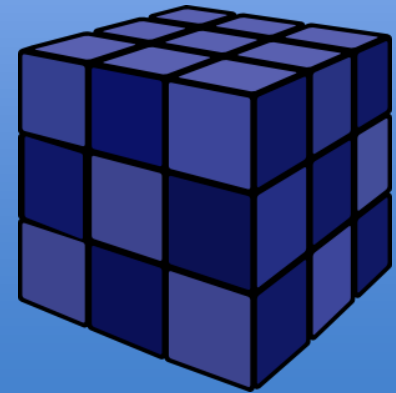
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<https://github.com/acloudfan/Blockchain-Course-ERC20-CourseToken>

Demo Source

CourseTokenV1.sol

CourseTokenV2.sol

CourseTokenV3.sol

Name, Symbol, Decimal

Non ERC20 compliant

```
function totalSupply() constant returns (uint256 totalSupply)
```

```
function balanceOf(address _owner) constant returns (uint256 balance)
```

```
function transfer(address _to, uint256 _value) returns (bool success)
```

```
event Transfer(address indexed _from, address indexed _to, uint256 _value)
```

is CourseTokenV1

```
function approve(address _spender, uint256 _value) returns (bool success)
```

```
function allowance(address _owner, address _spender) constant returns (uint256 remaining)
```

```
function transferFrom(address _from, address _to, uint256 _value) returns (bool success)
```

```
event Approval(address indexed _owner, address indexed _spender, uint256 _value)
```

is CourseTokenV2

Token administration + Rules + Custom functions

ERC20 Compliance

CourseTokenV1.sol

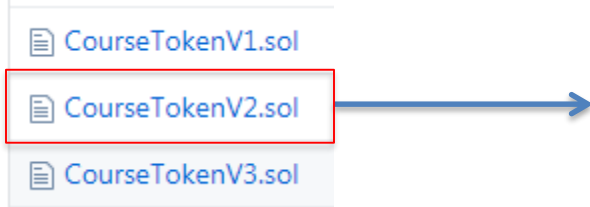
CourseTokenV2.sol

CourseTokenV3.sol

ERC20 compliant token

- Implements all required functions
- Emits the expected events
- Implements the standard ERC20 token behavior

ERC20 Compliance



Deployable to any tool that supports
ERC20 token standard

1. Deploy token to ROPSTEN
2. Add the token to MetaMask
3. Add the token to Wallet
4. Transfer 15 tokens between accounts