

Lesson 5 - Events and async operations

Events with solidity

- Event syntax
- Event storage
- Event indexing
- Topics and filters
- Transaction structure
- State changes with events

References

<https://docs.soliditylang.org/en/latest/contracts.html#events>

<https://dev.to/hideckies/ethers-js-cheat-sheet-1h5j>

Code reference

```
event NewVoter(address indexed voter);

event Delegated(
    address indexed voter,
    address indexed finalDelegate,
    uint256 finalWeight,
    bool voted,
    uint256 proposal,
    uint256 proposalVotes
);

event Voted(
    address indexed voter,
    uint256 indexed proposal,
    uint256 weight
);
```

Watching for events in tests

- Event syntax in waffle
- Triggering an event
- Checking arguments

References

<https://ethereum-waffle.readthedocs.io/en/latest/matchers.html#emitting-events>

Code reference

```
it("triggers the NewVoter event with the address of the new voter",
  async function () {
    const voterAddress = accounts[1].address;
    await expect(ballotContract.giveRightToVote(voterAddress))
      .to.emit(ballotContract, "NewVoter")
      .withArgs(voterAddress);
  });
```

Watching for events in scripts with Ethers.js

- Event syntax for Ethers.js library
- Filters, EventFilters and topics
- Event arguments
- Event listeners and memory usage
- Async logic
- Triggering functions inside the script
- Cleaning up after usage

References

<https://docs.ethers.io/v5/concepts/events/>

<https://docs.ethers.io/v5/api/contract/contract/#Contract--events>

<https://docs.ethers.io/v5/api/providers/types/#providers-Filter>

<https://docs.ethers.io/v5/api/providers/types/#providers-EventFilter>

Pooling time [issue](#)

Watching for events in scripts connected to the Testnet

- (Review) Connecting to a testnet with a RPC Provider
- Triggering events in a public blockchain
- Viewing events in etherscan

References

<https://docs.soliditylang.org/en/latest/abi-spec.html#events>

Homework

- Read the references
- Expand the script for logging from the last activity:
 - Voting right given
 - Print address of the receiver
 - Vote delegated

- Print address of the final delegate
- Print final voting weight of that delegate
- Print if the delegate has already voted
- Vote given
 - Whenever a vote is cast, display the winning proposal
 - (Optional Level 1) Also display its vote count
 - (Optional Level 2) Also display the name and vote counts of all other proposals