

wstETH

- [Source Code](#)
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What is wrapped stETH (wstETH)?

It's an [ERC-20](#) value-accruing token wrapper for stETH . Its balance does not change with each oracle report, but its value instETH does. Internally, it represents the user's [share](#) of the total supply of stETH tokens.

Why use wstETH?

wstETH is mainly used as a layer of compatibility to integrate stETH into other DeFi protocols, that do not support rebasable tokens, especially bridges to L2s and other chains, as rebases don't work for bridged assets by default.

How to use wstETH?

The contract can be used as a trustless wrapper that accepts stETH tokens and mints wstETH in return. When the user unwraps, the contract burns the user's wstETH , and sends the user locked stETH in return.

Staking shortcut

The user can send ETH with regular transfer to the address of the contract and get wstETH in return. The contract will send ETH to Lido submit method, staking it and wrapping the received stETH seamlessly under the hood.

Standards

Contract implements the following Ethereum standards:

- [ERC-20: Token Standard](#)
- [ERC-2612: Permit Extension for ERC-20 Signed Approvals](#)
- [EIP-712: Typed structured data hashing and signing](#)

View Methods

getWstETHByStETH()

Returns amount of wstETH for a given amount of stETH

function

getWstETHByStETH (uint256 _stETHAmount)

returns

(uint256)

Parameters

Name	Type	Description
_stETHAmount	uint256	amount of stETH

getStETHByWstETH()

Returns amount of stETH for a given amount of wstETH

function

getStETHByWstETH (uint256 _wstETHAmount)

returns

(uint256)

Parameters

Parameter	Name	Type	Description
	_wstETHAmount	uint256	amount of wstETH

stEthPerToken()

Returns the amount of stETH tokens corresponding to onewstETH

function

stEthPerToken ()

returns

(uint256)

tokensPerStEth()

Returns the number ofwstETH tokens corresponding to onestETH

function

tokensPerStEth ()

returns

(uint256)

Methods

wrap()

ExchangesstETH towstETH

function

wrap (uint256 _stETHAmount)

returns

(uint256) note Requirements:

- _stETHAmount
- must be non-zero
- msg.sender
- must approve at least _stETHAmount
- stETH to this contract.
- msg.sender
- must have at least _stETHAmount
- of stETH.

Parameters

Parameter	Name	Type	Description
	_stETHAmount	uint256	amount of stETH to wrap in exchange for wstETH

Returns

Amount of wstETH user receives after wrap

unwrap()

Exchanges wstETH tostETH

function

unwrap (uint256 _wstETHAmount)

returns

(uint256) note Requirements:

- _wstETHAmount

- must be non-zero
- msg.sender
- must have at least _wstETHAmount
- wstETH.

Parameters

Parameter Name Type Description _wstETHAmount uint256 amount of wstETH to unwrap in exchange for stETH

Returns

Amount of stETH user receives after unwrapping

receive()

Shortcut to stake ETH and auto-wrap returnedstETH

receive ()

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