DSR Manager - Detailed Documentation

The simplest way to integrate DSR in smart contracts TheDsrManager provides an easy to use smart contract that allows service providers to deposit/withdraw dai into the DSR contractpot , and activate/deactivate the Dai Savings Rate to start earning savings on a pool of dai in a single function call. To understand the DsrManager, it is necessary to have an understanding of thepot first. The DSR is set by Maker Governance, and will typically be less than the base stability fee to remain sustainable. The purpose of DSR is to offer another incentive for holding Dai.

Deployment Details

- Mainnet:0x373238337Bfe1146fb49989fc222523f83081dDb
- Kovan:0x7f5d60432DE4840a3E7AE7218f7D6b7A2412683a
- Ropsten:0x74ddba71e98d26ceb071a7f3287260eda8daa045
-

Contract Details

Math

- wad
-
    - some quantity of tokens, as a fixed point integer with 18 decimal places.
- ray
-
    - a fixed point integer, with 27 decimal places.
- rad
-
    - a fixed point integer, with 45 decimal places.
- mul(uint, uint)
- ,rmul(uint, uint)
- ,add(uint, uint)
- &sub(uint, uint)
-
    - will revert on overflow or underflow
- Rdiv
-
    - Divide tworay
- s and return a newray
- . Always rounds down. Aray
- is a decimal number with 27 digits of precision that is being represented as an integer.
- Rdivup
-
    - Divide tworay
- s and return a newray
- . Always rounds up. Aray
- is a decimal number with 27 digits of precision that is being represented as an integer.
-

Storage

- pot
-
    - stores the contract address of the main Dai Savings Rate contractpot
- .
- dai
-
    - stores the contract address of dai.
- daiJoin
-
    - stores the contract address of the Dai token adapter.
- supply
-
    - the supply of Dai in the DsrManager.
- pieOf
- -mapping (addresses=>uint256)
- mapping of user addresses and normalized Dai balances (amount of dai / chi
-) deposited intopot
- .

- pie
-
    - stores the address'pot
- balance.
- chi
-
    - the rate accumulator. This is the always increasing value which decides how much dai is given whendrip()
- is called.
- vat
-
    - an address that conforms to aVatLike
- interface.
- rho
-
    - the last time thatdrip
- is called.
-

Functions and mechanics

daiBalance(address usr) returns (uint wad)

- Calculates and returns the Dai balance of the specified address usr in the DsrManager contract. (Existing Dai balance + accrued dsr)
-

join(address dst, uint wad)

- uint wad
- this parameter specifies the amount of Dai that you want to join to the pot. Thewad
- amount of Dai must be present in the account ofmsg.sender
- .
- addressdst
- specifies a destination address for the deposited dai in the pot. Allows a hot wallet address (msg.sender
-) to deposit dai into the pot and transfer ownership of that dai to a cold wallet (or any other address for that matter)
- The normalized balancepie
- is calculated by dividing wad with the rate acumulatorchi
- .
- thedst
- 'spieOf
- amount is updated to include thepie
- .
- The total supply amount is also updated by adding thepie
- .
- wad
- amount of dai is transferred to the DsrManager contract
- The DsrManager contract joinswad
- amount of dai into the MCD system through the dai token adapterdaiJoin
- .
- The DsrManager contractjoin
- spie
- amount of dai to thepot
- .
-

exit(address dst, uint wad)

- exit()
- essentially functions as the exact opposite ofjoin()
- .
- uint wad
- this parameter is based on the amount of dai that you want toexit
- thepot
- .
- addressdst
- specifies a destination address for the retrieved dai from thepot
- . Allows a cold wallet address (msg.sender
-) to retrieve dai from thepot
- and transfer ownership of that dai to a hot wallet (or any other address for that matter)

- The normalized balancepie
- is calculated by dividing wad with the rate acumulatorchi
- .
- Themsg.sender
- 'spieOf
- amount is updated by subtracting thepie
- .
- The total supply amount is also updated by subtracting thepie
- .
- The contract calls exit on thepot
- contract.
- It calculates the amount of dai to retrieve by multiplyingpie
- withchi
- .
- Then exits the dai from the dai token adapterdaiJoin
- to the destination addressdst
- .
-

exitAll(address dst)

- exitAll()
- functions like theexit
- function, except it simply looks into the mappingpieOf
- , to determine how much dai themsg.sender
- has, andexit
- s the entire amount of dai, instead of a specified amount.
-

Gotchas / Integration Concerns

- In order to use thejoin
- function, you need toapprove
- the contract to transfer Dai from your wallet. You need to callapprove
- on the Dai token, specifying theDsrManager
- contract and the amount that the contract should be able to pull (can be set to-1
- , if you want to set an unlimited approval)
-

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