

Multi Collateral Dai (MCD) CLI

Welcome to the MCD CLI

Installation

First install [dapp tools](#) :

...

Copy curl <https://dapp.tools/install> | sh

...

Then install themcd package:

...

Copy dapp pkg install mcd

...

The following list details all of the commands available when interacting with the command-line interface:

...

Copy MCD - Multi-collateral Dai

Usage: mcd [] [] or: mcd help []

Commands:

bite Trigger liquidation of an unsafe Urn bites Recent bites cdp CDP management dai Dai management debt Total dai issuance drip Trigger stability fee accumulation flap Trigger a flap auction flips View flips and kick-off auctions flog Release queued bad-debt for auction flop Trigger a flop auction frob Urn management frobs Recent frobs gem Collateral management help Print help about mcd or one of its subcommands ilk Ilk (collateral type) parameters line Total debt ceiling live Liveness flag poke Update the spot price for a given ilk unwrap Unwrap WETH to ETH urn CDP state vice Total bad debt vow Liquidator balances wrap Wrap ETH to WETH

...

Configuration

Mcd is built on [Seth](#) and uses the same network configuration options, which just like Seth, can be defined in the `~/sethrc` initialisation file.

Similar to Seth, mcd also supports transaction signing with Ledger hardware wallets and can run against both local and remote nodes.

Since mcd will always be used against a known deployment of the system, defaults can be loaded wherever possible. In most cases the only required configuration parameter is the `-C, --chain= (MCD_CHAIN)` option and `-F, --from=`

(ETH_FROM) sender account when not using a testnet.

Example `~/sethrc` :

...

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#!/usr/bin/env bash

`export ETH_FROM=0x4Ffa8667Fe2db498DCb95A322b448eA688Ce430c export MCD_CHAIN=kovan`

...

Kovan

Run against the latest Kovan deployment by setting the-C, --chain option tokovan . Specify a sender account when sending transactions using the-F, --from option, or via theETH_FROM env variable.

...

Copy export ETH_FROM=0x4Ffa8667Fe2db498DCb95A322b448eA688Ce430c mcd --chain=kovan dai join 100

...

Remote testchain

Run against remote testchain deployments by setting the-C, --chain option to the remote testchain Id. Mcd will auto-configure account settings via the testchain api so that no further configuration is required. To view a list of available testchains run:

...

Copy mcd testnet chains`

...

Then set the chain option, or the chain env variable to the appropriate testchain Id.

...

Copy export MCD_CHAIN=12899149080555595289 mcd dai join 100

...

Local testnet

Run against a locally running instance of [Dapp testnet](#) where the system has been deployed by setting theC, --chain option totestnet . Mcd will auto-configure account testings fordapp testnet so that no further configuration is required.

By default, Mcd assumes that the output of the testchain deployment script is available at~/.dapp/testnet/8545/config/addresses.json . Configuration addresses can be loaded from a different location by setting the--config (MCD_CONFIG) option.

...

Copy export MCD_CONFIG=~/.testchain-deployment-scripts/out/addresses.json mcd -C testnet dai join 100

...

Ilk

Ilks are collateral types with corresponding risk parameters which have been approved by system governance. Use theilks command to view the list off available Ilks.

...

Copy mcd ilks ILK GEM DESC

ETH-A WETH Ethereum ETH-B WETH Ethereum REP-A REP Augur

...

Each Ilk has its own set of configuration parameters which can be viewed via theilk command. TheI, --ilk=option is used to scope commands to a particular Ilk:

...

Copy mcd --ilk=ETH-A ilk Art 40.000000000000000000 Total debt (DAI) rate 1.000080370887129123082627939 WETH DAI exchange rate spot 99.333333333333333333333333333333 WETH price with safety mat (USD) line 1000.000 Debt ceiling (DAI) dust 0.000 Debt floor (DAI) flip 0x9d905effff127a01da3b38124f8da88e766eb8dd Flip auction contract chop 1.000 Liquidation penalty lump 10000.000

auction lot size tax 1.000000000782997609082909351 Stability fee rho 1552802862 Last drip timestamp pip
0x98312e16f5b2c0def872a1f7484a8456e5a67a3b Price feed contract mat 1.50000000000000000000000000000000 Liquidation
ratio

...

Individual ilk values can be retrieved by adding the parameter name as an argument to theilk command:

...

Copy mcd --ilk=ETH-A ilk spot 99.333333333333333333333333333333

...

Gem

Gems are collateral tokens. Collateral is added and removed from the via adapters, which abstract away the differences between various token behaviours. Usegem [] to manage collateral balances for any given ilk.

...

Copy gem --ilk=symbol Gem symbol e.g. WETH gem --ilk= balance Print balances for a given urn (default: ETH_FROM)
gem --ilk= join Add collateral to a given Urn (default: ETH_FROM) gem --ilk= exit [] Remove collateral from an Urn (default:
ETH_FROM)

...

Thejoin command can add collateral from the sender account to any specified Urn. Theexit command can remove collateral from a specified Urn, provided that the sender controls the private key associated with that Urn.

By default,ETH_FROM is used to determine which Urn should be credited with collateral. UseU, --urn=

to optionally credit an Urn other than the default.

...

Copy mcd --ilk=ETH-A --urn=0x123456789abcdef0123456789abcdef012345678 join 100

...

Theexit command can remove collateral from a specified Urn, provided that the sender controls the private key associated with that Urn. Theexit command can also withdraw collateral to an account other thanETH_FROM by passing the destination address as an additional argument:

...

Copy mcd --ilk=ETH-A exit 100 0xDecaf00

...

Urn

Urns represent Cdp state for any given Urn address.

Use theurn command to view Urn state for any given ilk:

...

Copy ilk ETH-A Collateral type urn 0xC93C178EC17B06bddBa0CC798546161aF9D25e8A Urn handler ink
45.00000000000000000000000000000000 Locked collateral (WETH) art 120.00000000000000000000000000000000 Issued debt (Dai) tab
120.000244107582797248312544980 Outstanding debt (Dai) rap 0.000244107582797248312544980 Accumulated stability
fee (Dai) --> 37.24 Collateralization ratio

spot 99.33 WETH price with safety mat (USD) rate 1.000002034229856643749638820
WETH DAI exchange rate

...

By default, `ETH_FROM` is used to determine which Urn to query. Use the `U`, `--urn=` option to query Urns at other indexes.

Urn management

Urn state (`urn.ink` and `urn.art`) is managed via the `frob` command, where `dink` and `dart` are delta amounts by which `ink` (Locked collateral) and `art` (Outstanding debt) should be changed. For example, to lock 100 WETH and draw 400 Dai on the ETH-A ilk:

...

```
Copy mcd --ilk=ETH-A frob 100 400
```

...

To reduce outstanding debt by 200 Dai whilst keeping the amount of locked collateral constant:

...

```
Copy mcd --ilk=ETH-A frob -- 0 -200
```

...

Dai

Similar to Gem adapters, a Dai adapter is used to exchange Vat Dai for ERC20 token Dai which can then be used outside the system. Use `dai []` to manage dai balances.

...

```
Copy dai balance Print balances for a given urn (default: ETH_FROM) dai join Exchange DSToken Dai for Vat Dai dai exit Exchange Vat Dai for DSToken Dai
```

...

Once Dai has been drawn on an Urn, it can be withdrawn for use outside the system using `dai exit`. Dai can be returned to repay Urn debt via `dai join`.

The `dai balance` command displays the internal system (vat) balance and the external (ext) token balance:

...

```
Copy mcd dai balance vat 1030.003120998308631176024235912000000000000000000 Vat balance ext 0.000000000000000000 ERC20 balance
```

...

Individual balance values can be retrieved by adding `vat` or `ext` as an argument to the `balance` command:

...

```
Copy mcd dai balance vat 1030.003120998308631176024235912000000000000000000
```

...

Cdp

The `cdp` command provides compatibility with CDPs managed via the CDP Portal and uses the same proxy contract and [Cdp Manager](#) front-end. This allows CDPs to be managed via a unique integer identifier rather than the `l`, `--ilk` and `U`, `--urn` options.

...

```
Copy Usage: mcd cdp [] []
```

Commands: *ls [] List Cdp count [] Cdp count open Open a new Cdp urn Cdp state lock Join & lock collateral free Free & exit collateral draw Draw & exit dai wipe Join & wipe dai*

...

Examples

Note: examples assume that *ETH_FROM* is set to an address controlled by the user, and that the *MCD_CHAIN* env variable has been set to a valid chain identifier.

1. Native Urn - lock 100 ETH & draw 500 Dai

Note: The system doesn't handle ETH directly but instead uses WETH to represent ETH collateral. For convenience, the *wrap* and *unwrap* commands are provided for exchanging ETH to WETH and visa versa.

...

Copy

i) Wrap

```
mcd wrap 100 eth 900.000000000000000000 weth 100.000000000000000000
```

ii) Gem join

```
mcd --ilk=ETH-A gem join 100 Grant approval to move WETH to the Vat? [Y/n]: Y vat 100.000000000000000000 Free collateral (WETH) ink 0.000000000000000000 Locked collateral (WETH) ext 0.000000000000000000 External account balance (WETH) ext 900.000000000000000000 External account balance (ETH)
```

iii) Lock & Draw

```
mcd --ilk=ETH-A frob 100 500 ilk ETH-A Collateral type urn 0xC93C178EC17B06bddBa0CC798546161aF9D25e8A Urn handler ink 100.000000000000000000 Locked collateral (WETH) art 500.000000000000000000 Issued debt (Dai) tab 500.000244107582797248312544980 Outstanding debt (Dai) rap 0.000244107582797248312544980 Accumulated stability fee (Dai) --> 19.86 Collateralization ratio
```

iv) Withdraw Dai

```
mcd dai exit 500 vat 0.0000606823183625118849620000000000000000000000000000000 Vat balance ext 500.000000000000000000 ERC20 balance
```

...

1. Managed Cdp - lock 100 REP & draw 50 Dai

...

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i) Open

```
mcd --ilk=REP-A cdp open mcd-cdp-open: Waiting for transaction receipt...  
0x800e5578d3ac4b77b7ada1aba48cf80d0d238d4392d2676d79159eac2c2cdd73 Opened: cdp 19
```

ii) Lock

mcd --ilk=REP-A cdp 19 lock 100 seth-send: Published transaction with 260 bytes of calldata. seth-send: 0x4d30cb4863ca997d24ff2346c9a92e86648369ce7b4a86ed004c73b8d4ef299a seth-send: Waiting for transaction receipt... seth-send: Transaction included in block 333. ilk REP-A Collateral type urn 0x4518c4709a50C915b7996A0e6Dfb38c67248BBcF Urn handler ink 100.000000000000000000 Locked collateral (REP) art 0.000000000000000000 Issued debt (Dai) tab 0 Outstanding debt (Dai) rap 0 Accumulated stability fee (Dai) --> 0 Collateralization ratio

iii) Draw

mcd --ilk=REP-A cdp 19 draw 500 seth-send: Published transaction with 260 bytes of calldata. seth-send: 0xd5fb7ddf94bb910fbba2af118ecde88a03a13129b2e1979238236afe672781c3 seth-send: Waiting for transaction receipt... seth-send: Transaction included in block 335. ilk REP-A Collateral type urn 0x4518c4709a50C915b7996A0e6Dfb38c67248BBcF Urn handler ink 100.000000000000000000 Locked collateral (REP) art 49.999505439113270178 Issued debt (Dai) tab 50.000000000000000000000000000000 Outstanding debt (Dai) rap 0.000494560886729822000020743 Accumulated stability fee (Dai) --> 16.66 Collateralization ratio

...

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