

# DynSC: Dynamic Smart Contract

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## Goal

Proof of Concept using Hyperledger Fabric and Hyperledger Composer to illustrate a research paper about *dynamic smart-contracts for permissioned blockchains*.

We extended our initial use-case on Convector & Hurley because Composer has been deprecated in the meantime. Moreover, we also did a benchmark study comparing [Sattelite pattern](#) over Ethereum against our solution based on *dynamic parameterization* over Hyperledger Fabric.

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## Usage

About the installation procedures of the tools you should refer to the official documentations:

- [NPM](#)
- [Hyperledger Fabric](#)
- [Hyperledger Composer](#)
- [Hyperledger Composer-Playground](#)
- [Worldsibu Convector](#)
- [Worldsibu Hurley](#)
- [Truffle](#)
- [Truffle Ganache-CLI](#)
- [Ethereum Web3 library](#)

### 1st version

See 'v1/'.

#### Hyperledger Composer Playground

The first possibility, in a development purpose, is to use the *composer-playground* tool to directly import the BNA (or copy-paste the .cto and .js files). Then, you will be able to play and test the smart contract without the Hyperledger Fabric dependencies.

```
$ composer-playground -p 8080
$ firefox http://localhost:8080
```

#### Hyperledger Fabric and Composer

The second possibility, in a full test purpose, is to use the *composer* tool to deploy the chaincode from the *BNA* over a existing network instance of *Fabric* blockchain.

```
[Fabric] Starts network nodes...
$ docker-compose -f network.yaml up

[Composer] Deploys smart contract over nodes...
$ composer network install --card <card> --archiveFile dyn-sc.bna
```

```
$ composer network start --card <card> --networkName dyn-sc --  
networkVersion 0.1.0 -A <Admin> -S <AdminPassword>  
$ composer transaction submit --card <card> --data <json_data>
```

## 2nd version

See 'v2/'.

Ethereum with Truffle & Ganache

See 'v2/dynsc-eth'.

Hyperledger Fabric with Convector & Hurley

See 'v2/dynsc-eth'.

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## Paper

Submitted on the 25-10-2019.

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## Code snippet

The code available in this repository is developed and tested with *composer-playground*. It is composed of two main files: one model file '*dynsc.cto*' and one script file '*dynsc.js*'. These files are defining a small chaincode based on a simple use-case as a proof of concept. The '*dynsc.bna*' file is including the previous files, this is the smart contract exported by *composer* in a Business Archive Network.

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