Smart Contract Programming with C#

NEO
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About Us

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CITY OF ZION

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Agenda

- Introduction NEO Smart Contracts
- NEO Ecosystem
- VM & Smart Contracts
- Tools; Installation, Docker, Run
- SmartVote
- Interaction with Blockchain and Smart Contracts
- https://github.com/red4sec/NEO-SmartVote

The Smart Contracts Importance

- Blockchain is not just about money
- Running decentralized Apps
  - Run on VM nodes
  - Use Blockchain Storage
- Trust & immutability
  - No need of Third-Parties
  - History stored on the blockchain

NEO Ecosystem

Blockchain Nodes

- Neo-cli, neo-gui, **neo-python** …

Smart-Contract language

- **C#**, Java, Python, Kotlin, Golang, JavaScript …

Compilers

- **neon**, neoj, neo-boa …

https://github.com/CityOfZion/awesome-neo

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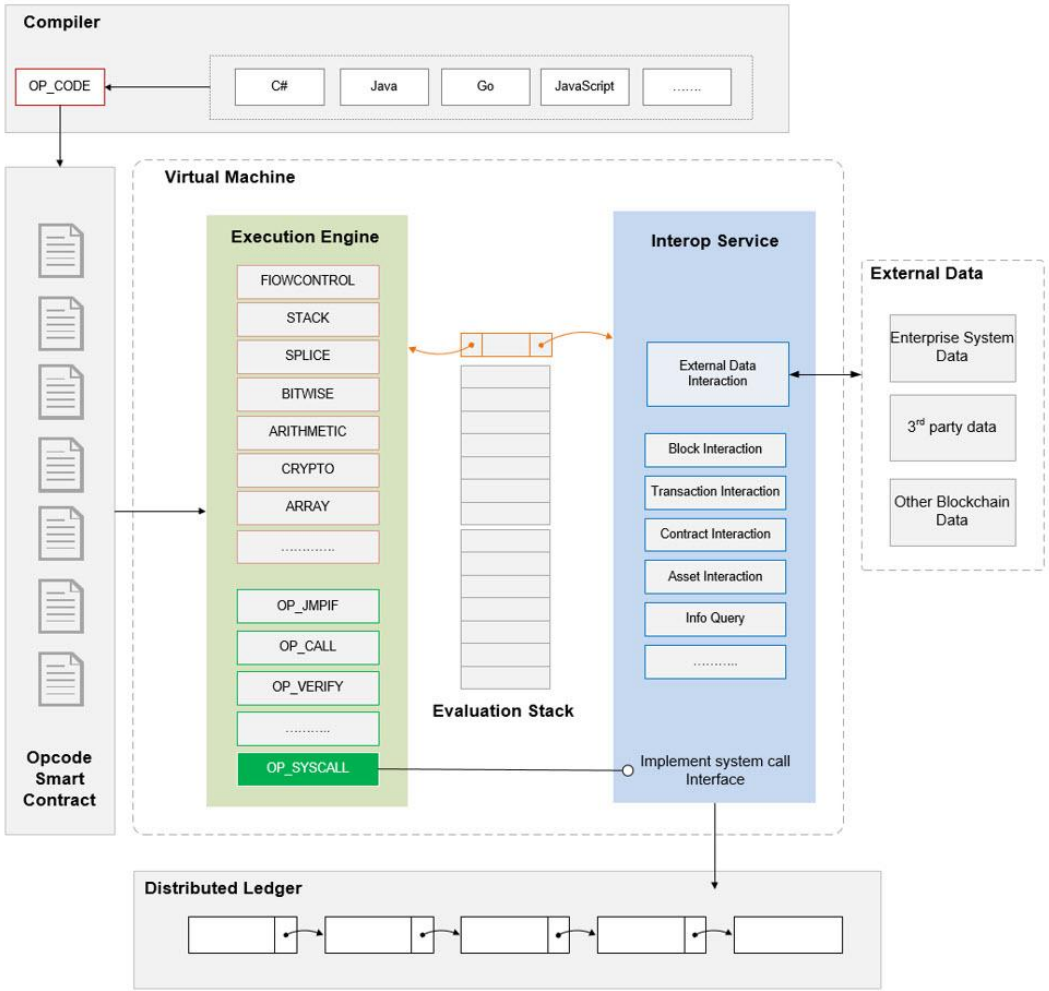
NEO VM and Smart Contracts



NEO smart economy

Tools: neo-privatenet-docker

Private blockchain network for NEO development in a single Docker container

- Set up 4 node network
- Wallet with NEO and GAS
- https://github.com/CityOfZion/neo-privatenet-docker
- https://hub.docker.com/r/cityofzion/neo-privatenet

```
> docker pull cityofzion/neo-privatenet
> docker run --rm -d --name neo-privatenet -p 20333-20336:20333-20336/tcp -p
30333-30336:30333-30336/tcp cityofzion/neo-privatenet
```

Tools: Neon

Neon compiler for the Neo Virtual Machine

- From Github (git clone)

```
> git clone https://github.com/neo-project/neo-compiler
```

- Compile

```
> cd neo-compiler/neon
> dotnet publish -c Release -r win10-x64
> dotnet publish -c Release -r ubuntu.16.10-x64
```

- Environment path
  - Set **neon** path in System Variables

Tools: Neo-python

Python Node and SDK for the NEO blockchain

- Dependences

```
> apt-get install python3.6 python3.6-dev python3.6-venv python3-pip
libleveldb-dev libssl-dev g++ docker-compose docker.io
```

- From Github (git clone)
- PyPi

```
> python3.6 -m venv
> source venv/bin/activate
> pip install neo-python
```

- https://github.com/CityOfZion/neo-python

- Run

```
> np-prompt [-m] [-p]
```

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Tools: Neo-local

Quickly setup a local environment for NEO smart contract development

- neo-privatenet (consensus nodes)
- neo-python (CLI)
- neon (compiler)
- neo-scan (block explorer) & Postgres - http://localhost:4000

```
> apt-get install docker-compose docker.io curl
> git clone https://github.com/CityOfZion/neo-local
> cd neo-local
> make start
> make stop
```

- https://github.com/CityOfZion/neo-local

SmartVote

Smart Contract example to carry out a vote

- Decentralized app
- Stored in the Blockchain
- Results are unalterable (nobody can cheat), Trustworthy
- Support for multiple voting
- Only authorized people can vote
- https://github.com/Red4Sec/NEO-SmartVote

SmartVote - Functions

Register Proposals

- PROPOSAL ID
- DESCRIPTION
- AUTHORIZED ADDR 1
- AUTHORIZED ADDR N
- …

Vote

- PROPOSAL ID
- VOTER ADDR
- VOTE (Y/N)

Count Votes

- PROPOSAL ID

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SmartVote - Smart Contract

Interact with SmartVote contract

- help
- open wallet
- import contract
- testinvoke
- config sc-events on

Developers Community

All-in-One	https://github.com/CityOfZion/awesome-neo
NEO Doc	http://docs.neo.org
NEO Doc	https://github.com/neo-project/docs
CityOfZion	http://cityofzion.io
Discord	https://discord.gg/R8v48YA

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