Instructions to deploy KYC contract on local private blockchain network setup (Geth / Ganache)

Pre-Requisite: Geth based private blockchain network set-up and Truffle Setup

Note: Only few of the contract's APIs are shown.

- ## Steps to compile and deploy and verify

a. Initialize / create a private chain data for our blockchain

```
geth --datadir ./datadir_KYC init ./genesis_KYC.json
```

```
For more details, please visit https://support.apple.com/kb/HT208050.
Rajeshs-MacBook-Pro:ethereumprivatenetwork v4u2chat$ geth --datadir ./datadir_KYC init ./genesis_KYC.json
INFO [03-20|10:42:56.738] Maximum peer count                       ETH=50 LES=0 total=50
INFO [03-20|10:42:56.764] Allocated cache and file handles         database=/Users/v4u2chat/Dev/ethereumprivatenetwork/datadir_KYC/geth/chaindata cache=16.00MiB handles=16
INFO [03-20|10:42:56.801] Writing custom genesis block
INFO [03-20|10:42:56.804] Persisted trie from memory database      nodes=0 size=0.00B time=15.907µs gcnodes=0 gcsize=0.00B gctime=0s livenodes=1 livesize=0.00B
INFO [03-20|10:42:56.805] Successfully wrote genesis state         database=chaindata hash=56abbf…d66680
INFO [03-20|10:42:56.805] Allocated cache and file handles         database=/Users/v4u2chat/Dev/ethereumprivatenetwork/datadir_KYC/geth/lightchaindata cache=16.00MiB handles=16
INFO [03-20|10:42:56.827] Writing custom genesis block
INFO [03-20|10:42:56.827] Persisted trie from memory database      nodes=0 size=0.00B time=6.843µs  gcnodes=0 gcsize=0.00B gctime=0s livenodes=1 livesize=0.00B
INFO [03-20|10:42:56.829] Successfully wrote genesis state         database=lightchaindata hash=56abbf…d66680
Rajeshs-MacBook-Pro:ethereumprivatenetwork v4u2chat$ `
```

b. Start our network

```
geth --datadir ./datadir_KYC/ --networkid 20032020 console
```

```
ethereumprivatenetwork — geth --datadir ./datadir_KYC/ --networkid 20032020 --rpc --rpcport 30303 --allow-insecure-unlock console — 179×31
~/Dev/ethereumprivatenetwork — -bash    ...dir_KYC/ --networkid 20032020 --rpc --rpcport 30303 --allow-insecure-unlock console    ~/Dev/BlockchainProjects/UpGrad_KYC — -bash

Rajeshs-MacBook-Pro:ethereumprivatenetwork v4u2chat$ geth --datadir ./datadir_KYC/ --networkid 20032020 --rpc --rpcport 30303 --allow-insecure-unlock console
INFO [03-21|05:21:23.237] Maximum peer count                       ETH=50 LES=0 total=50
INFO [03-21|05:21:23.262] Starting peer-to-peer node               instance=Geth/v1.9.11-stable/darwin-amd64/go1.13.8
INFO [03-21|05:21:23.262] Allocated trie memory caches             clean=256.00MiB dirty=256.00MiB
INFO [03-21|05:21:23.263] Allocated cache and file handles         database=/Users/v4u2chat/Dev/ethereumprivatenetwork/datadir_KYC/geth/chaindata cache=512.00MiB handles=5120
INFO [03-21|05:21:23.447] Opened ancient database                  database=/Users/v4u2chat/Dev/ethereumprivatenetwork/datadir_KYC/geth/chaindata/ancient
INFO [03-21|05:21:23.451] Initialised chain configuration          config="{ChainID: 20032020 Homestead: 0 DAO: 0 DAOSupport: true EIP150: 0 EIP155: 0 EIP158: 0 Byzantium: <nil> C
onstantinople: <nil> Petersburg: <nil> Istanbul: <nil>, Muir Glacier: <nil>, Engine: unknown}"
INFO [03-21|05:21:23.451] Disk storage enabled for ethash caches   dir=/Users/v4u2chat/Dev/ethereumprivatenetwork/datadir_KYC/geth/ethash count=3
INFO [03-21|05:21:23.451] Disk storage enabled for ethash DAGs     dir=/Users/v4u2chat/Library/Ethash count=2
INFO [03-21|05:21:23.452] Initialising Ethereum protocol           versions="[65 64 63]" network=20032020 dbversion=7
INFO [03-21|05:21:23.454] Loaded most recent local header          number=6955 hash=0a0972…67869e td=6419466960 age=11h29m4s
INFO [03-21|05:21:23.454] Loaded most recent local full block      number=6955 hash=0a0972…67869e td=6419466960 age=11h29m4s
INFO [03-21|05:21:23.454] Loaded most recent local fast block      number=6955 hash=0a0972…67869e td=6419466960 age=11h29m4s
INFO [03-21|05:21:23.458] Loaded local transaction journal         transactions=6 dropped=6
INFO [03-21|05:21:23.464] Regenerated local transaction journal    transactions=0 accounts=0
WARN [03-21|05:21:23.465] Switch sync mode from fast sync to full sync
INFO [03-21|05:21:23.545] New local node record                    seq=5 id=8c30bd58202a0ab9 ip=127.0.0.1 udp=30303 tcp=30303
INFO [03-21|05:21:23.546] Started P2P networking                   self=enode://ee90ff249d6d3b12e86b9284b27465f4a2a6639cb43de650fd5d54c532bea2c71d2d42764e62de6dbb85bf435eb6cc46562
1413186fb3ef60ac5c36915724c37@127.0.0.1:30303
INFO [03-21|05:21:23.548] IPC endpoint opened                      url=/Users/v4u2chat/Dev/ethereumprivatenetwork/datadir_KYC/geth.ipc
INFO [03-21|05:21:23.549] HTTP endpoint opened                     url=http://127.0.0.1:30303 cors= vhosts=localhost
INFO [03-21|05:21:23.602] Etherbase automatically configured       address=0xc7b79f0528FFe214c78cAAe22CA607e64eE47F4b
Welcome to the Geth JavaScript console!

instance: Geth/v1.9.11-stable/darwin-amd64/go1.13.8
coinbase: 0xc7b79f0528ffe214c78caae22ca607e64ee47f4b
at block: 6955 (Fri Mar 20 2020 17:52:19 GMT+0530 (IST))
 datadir: /Users/v4u2chat/Dev/ethereumprivatenetwork/datadir_KYC
 modules: admin:1.0 debug:1.0 eth:1.0 ethash:1.0 miner:1.0 net:1.0 personal:1.0 rpc:1.0 txpool:1.0 web3:1.0
```

c. Compile our KYC contract code

```
truffle compile
```

```
Rajeshs-MacBook-Pro:UpGrad_KYC v4u2chat$ truffle compile

Compiling your contracts...
===========================
> Compiling ./contracts/KYC.sol
> Artifacts written to /Users/v4u2chat/Dev/BlockchainProjects/UpGrad_KYC/build/contracts
> Compiled successfully using:
   - solc: 0.5.16+commit.9c3226ce.Emscripten.clang
```

d. Deploy KYC contract

```
truffle migrate --reset --network geth
```

```
Rajeshs-MacBook-Pro:UpGrad_KYC v4u2chat$ truffle migrate --reset --network development

Compiling your contracts...
===========================
> Everything is up to date, there is nothing to compile.


Starting migrations...
======================
> Network name:    'development'
> Network id:      20032020
> Block gas limit: 0x7a1200


1_initial_migration.js
======================

   Replacing 'Migrations'
   ----------------------
   > transaction hash:    0xd4a0d52d8a905ade157c710a14b27ffeae1afec415330f1cec6deae0d3e8b898
   > Blocks: 1            Seconds: 8
   > contract address:    0x16C20AF94EAbe5e31Eeeb7796Dd0e7F312bF99DA
   > block number:        6666
   > block timestamp:     1584704389
   > account:             0xc7b79f0528FFe214c78cAAe22CA607e64eE47F4b
   > balance:             33330
   > gas used:            188483
   > gas price:           20 gwei
   > value sent:          0 ETH
   > total cost:          0.00376966 ETH


   > Saving migration to chain.
   > Saving artifacts
   -------------------------------------
   > Total cost:          0.00376966 ETH


2_KYC_deployment.js
===================

   Replacing 'KYC'
   ---------------
   > transaction hash:    0xa9dc74d44b6285b56dd9bf14edb0c13f907a6329bfa9698dbb99dd247e94d836
   > Blocks: 1            Seconds: 8
   > contract address:    0xD7881D284F05A517F221af2F2aB717a85c057dB1
   > block number:        6670
   > block timestamp:     1584704427
   > account:             0xc7b79f0528FFe214c78cAAe22CA607e64eE47F4b
   > balance:             33350
   > gas used:            4175487
   > gas price:           20 gwei
   > value sent:          0 ETH
   > total cost:          0.08350974 ETH


   > Saving migration to chain.
   > Saving artifacts
   -------------------------------------
   > Total cost:          0.08350974 ETH


Summary
=======
> Total deployments:   2
> Final cost:          0.0872794 ETH
```

e. Verify the contact deployed in Ganache

f. Verify the contact deployed in console / Ganache

```
truffle console --network geth
```

```
UpGrad_KYC — node /usr/local/bin/truffle console --network geth — 180×31
~/Dev/ethereumprivatenetwork — -bash   ...KYC/ --networkid 20032020 --rpc --rpcport 30303 --allow-insecure-unlock console   ...v/BlockchainProjects/UpGrad_KYC — node /usr/local/bin/truffle console --network geth

Rajeshs-MacBook-Pro:UpGrad_KYC v4u2chat$ truffle console --network geth
truffle(geth)> var kyc = await KYC.deployed()
undefined
truffle(geth)> kyc.
kyc.__defineGetter__          kyc.__defineSetter__          kyc.__lookupGetter__          kyc.__lookupSetter__          kyc.__proto__                 kyc.hasOwnProperty
kyc.isPrototypeOf             kyc.propertyIsEnumerable      kyc.toLocaleString            kyc.toString                  kyc.valueOf

kyc.BankBlockedFromKYC        kyc.BankRemoved               kyc.ContractInitialized       kyc.CustomerInfoModified      kyc.CustomerRemoved           kyc.CustomerRequestAdded
kyc.CustomerRequestApproved   kyc.CustomerRequestRemoved     kyc.NewBankCreated            kyc.NewCustomerCreated        kyc.abi                       kyc.addBank
kyc.addCustomer               kyc.addNewCustomerRequest     kyc.address                   kyc.allEvents                 kyc.blockBankFromKYC          kyc.blockBankFromVoting
kyc.constructor               kyc.contract                  kyc.downVoteCustomer          kyc.getCustomerKycStatus      kyc.getPastEvents             kyc.getReportCountOfBank
kyc.methods                   kyc.modifyCustomer            kyc.removeBank                kyc.removeCustomer            kyc.removeCustomerRequest     kyc.reportSuspectedBank
kyc.send                      kyc.sendTransaction           kyc.transactionHash           kyc.upVoteCustomer            kyc.viewCustomerData

truffle(geth)> kyc.
```

g. Create some banks for verification

```
UpGrad_KYC — node /usr/local/bin/truffle console --network geth — 180×36
~/Dev/ethereumprivatenetwork — -bash   ...KYC/ --networkid 20032020 --rpc --rpcport 30303 --allow-insecure-unlock console   ...v/BlockchainProjects/UpGrad_KYC — node /usr/local/bin/truffle console --network geth

truffle(geth)> kyc.addBank('SBI','SBI-1','0xF5E4039410f29f6358eea51BFbBcCbb58e984D3a')
{
  tx: '0x438fcb182583bd28489256808bebcdd705d790ba507013d676ef02407265138d',
  receipt: {
    transactionHash: '0x438fcb182583bd28489256808bebcdd705d790ba507013d676ef02407265138d',
    transactionIndex: 0,
    blockHash: '0xc9c94a7f280a4fec7af76faed9c76ed6abc058dd36475382472326534fbfb400',
    blockNumber: 11,
    from: '0xc61b4a8c9733cdf7e105e4c57219c08fe6ccf991',
    to: '0xc47b9414dd25af4d1caea9565587434d4840a4ed',
    gasUsed: 155334,
    cumulativeGasUsed: 155334,
    contractAddress: null,
    logs: [ [Object] ],
    status: true,
    logsBloom: '0x00040000000000
```

```
truffle(geth)> kyc.addBank('Digibank','DBs-1','0x1c2d5340bf89E3f3Ca501b7653B17f114482FcFf')
{
  tx: '0xfe80903aff94ba372742d9ff82e903181f163374696b014ba67ad182b6ffa0c0',
  receipt: {
    transactionHash: '0xfe80903aff94ba372742d9ff82e903181f163374696b014ba67ad182b6ffa0c0',
    transactionIndex: 0,
    blockHash: '0x7ea2974e3e54be40c999e2c42009592b83acabae26e70a542b0888ce5af3e55e',
    blockNumber: 13,
    from: '0xc61b4a8c9733cdf7e105e4c57219c08fe6ccf991',
    to: '0xc47b9414dd25af4d1caea9565587434d4840a4ed',
    gasUsed: 140654,
    cumulativeGasUsed: 140654,
    contractAddress: null,
    logs: [ [Object] ],
    status: true,
    logsBloom: '0x0004000000000
```

h. Do some bank operation by setting the ether base in one geth console.

```
truffle console --network geth

kyc.addBank('SBI','SBI1','0x20e97dc833826746c9324b4333c42d2d405
d0648')
```

```
truffle(geth)> kyc.addBank('DBS','DBS#123','0xb3d12625484c6567cece4d170e52c6095beda315')
{
  tx: '0x3c4f05c6cee9761abac6e907c2811145559adb0befa3931aa9bfc04fef0556d6',
  receipt: {
    transactionHash: '0x3c4f05c6cee9761abac6e907c2811145559adb0befa3931aa9bfc04fef0556d6',
    transactionIndex: 0,
    blockHash: '0x89711c8371d2bcddbbb0f0b39847a39d7d1933c16816b6cf55b9f503b8df28ee',
    blockNumber: 40,
    from: '0xc61b4a8c9733cdf7e105e4c57219c08fe6ccf991',
    to: '0x2562d5174f07b607395df1a463268fb3871eec5f',
    gasUsed: 140462,
    cumulativeGasUsed: 140462,
    contractAddress: null,
    logs: [ [Object] ],
    status: true,
    logsBloom: '0x00040000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000
```

```
truffle(geth)> kyc.addBank('SBI','SBI1','0x20e97dc833826746c9324b4333c42d2d405d0648')
{
  tx: '0x8d13658cd2c3553d6fd46e75a57962e7cb05e8cd4ec01475ef1731ef172c28c6',
  receipt: {
    transactionHash: '0x8d13658cd2c3553d6fd46e75a57962e7cb05e8cd4ec01475ef1731ef172c28c6',
    transactionIndex: 0,
    blockHash: '0xba13119a94daaac1e218bdeaec5339c7c98083fecb2c51ca6887564751b8b6e7',
    blockNumber: 38,
    from: '0xc61b4a8c9733cdf7e105e4c57219c08fe6ccf991',
    to: '0x2562d5174f07b607395df1a463268fb3871eec5f',
    gasUsed: 155270,
    cumulativeGasUsed: 155270,
    contractAddress: null,
    logs: [ [Object] ],
    status: true,
    logsBloom: '0x0004000000000
```

```
truffle(geth)> kyc.blockBankFromKYC('0xb3d12625484c6567cece4d170e52c6095beda315')
{
  tx: '0x29ee573ce6ee71309f2a73ae0565448d3986daa89b454a4050b0e79673edc34e',
  receipt: {
    transactionHash: '0x29ee573ce6ee71309f2a73ae0565448d3986daa89b454a4050b0e79673edc34e',
    transactionIndex: 0,
    blockHash: '0x7c31673836cdbf2c5f421231e320b805f76b22102353481222a413ff9583aed4',
    blockNumber: 43,
    from: '0xc61b4a8c9733cdf7e105e4c57219c08fe6ccf991',
    to: '0x2562d5174f07b607395df1a463268fb3871eec5f',
    gasUsed: 29611,
    cumulativeGasUsed: 29611,
    contractAddress: null,
    logs: [ [Object] ],
    status: true,
    logsBloom: '0x00000000000
```

j. Do some bank operation by setting the ether base in one geth

a. Add KYC Request

```
kyc.addNewCustomerRequest('rajesh','GADEPARTHI')
```

```
undefined
truffle(geth)> kyc.addNewCustomerRequest('rajesh','GADEPARTHI')
{
  tx: '0xe6d7b40dd7bc81c237a0577c86a0af0199d4a68d3e3de2567c87497d05cffef4',
  receipt: {
    transactionHash: '0xe6d7b40dd7bc81c237a0577c86a0af0199d4a68d3e3de2567c87497d05cffef4',
    transactionIndex: 0,
    blockHash: '0x0f9436d50b7e7949c6899fe69c7784814545ae13bf827d18af34c226c1ff59a4',
    blockNumber: 53,
    from: '0xc61b4a8c9733cdf7e105e4c57219c08fe6ccf991',
    to: '0x915d6e367a35646a23882cef00b00fedbe580b19',
    gasUsed: 133355,
    cumulativeGasUsed: 133355,
    contractAddress: null,
    logs: [ [Object] ],
    status: true,
    logsBloom: '0x00000000000000000000000000000200000000000000000000000000000000000000000000000000000000100000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000200004000000000000000000000000000000000000000000000000',
    v: '0x1b',
    r: '0x2835befad350f290eaf18e36fe6924b776174906f2fe2d75f25f158800f17172',
    s: '0x4032d50c97b2155bed184107b4eca86a3c14fc5eaa20c31e36fa1f56d6201f8e',
    rawLogs: [ [Object] ]
  },
  logs: [
    {
      logIndex: 0,
      transactionIndex: 0,
      transactionHash: '0xe6d7b40dd7bc81c237a0577c86a0af0199d4a68d3e3de2567c87497d05cffef4',
      blockHash: '0x0f9436d50b7e7949c6899fe69c7784814545ae13bf827d18af34c226c1ff59a4',
      blockNumber: 53,
      address: '0x915D6E367a35646a23882cEF00B00FEdbe580B19',
      type: 'mined',
      id: 'log_ecdaa78c',
      event: 'CustomerRequestAdded',
      args: [Result]
    }
  ]
}
truffle(geth)>
```

b. Up Vote Customer

```
kyc.upVoteCustomer('rajesh')
```

```
truffle(geth)> kyc.upVoteCustomer('rajesh')
{
  tx: '0x59163a5149cf94c4cf643a6f0fdf29dd5a42fe8d7df1798532e26a80e4ea7912',
  receipt: {
    transactionHash: '0x59163a5149cf94c4cf643a6f0fdf29dd5a42fe8d7df1798532e26a80e4ea7912',
    transactionIndex: 0,
    blockHash: '0x2f2308836bb02dd2844c6904bd4fc5f1807c70f694cb6ab0f9c30c8f8cdffb78',
    blockNumber: 56,
    from: '0xc61b4a8c9733cdf7e105e4c57219c08fe6ccf991',
    to: '0x915d6e367a35646a23882cef00b00fedbe580b19',
    gasUsed: 91931,
    cumulativeGasUsed: 91931,
    contractAddress: null,
    logs: [],
    status: true,
    logsBloom: '0x00000000000
```

```
truffle(geth)> kyc.viewCustomerData('rajesh')
{
  tx: '0x13b7576b6d035f31337a9955f4d7d600d078fa0a179ff508b54158973fbf7720',
  receipt: {
    transactionHash: '0x13b7576b6d035f31337a9955f4d7d600d078fa0a179ff508b54158973fbf7720',
    transactionIndex: 0,
    blockHash: '0xbc1feaab4ac98af4b44c3f0462dec3bf3b9a4cb0b54bd8cc849c4691f7b1fa1b',
    blockNumber: 57,
    from: '0xc61b4a8c9733cdf7e105e4c57219c08fe6ccf991',
    to: '0x915d6e367a35646a23882cef00b00fedbe580b19',
    gasUsed: 45771,
    cumulativeGasUsed: 45771,
    contractAddress: null,
    logs: [],
    status: true,
    logsBloom: '0x00000000000
```

Ganache Edit View Window Help 100% Mon 6:56 PM

Ganache

ACCOUNTS BLOCKS TRANSACTIONS CONTRACTS EVENTS LOGS

SEARCH FOR BLOCK NUMBERS OR TX HASHES

CURRENT BLOCK	GAS PRICE	GAS LIMIT	HARDFORK	NETWORK ID	RPC SERVER	MINING STATUS	WORKSPACE	
64	20000000000	6721975	PETERSBURG	5777	HTTP://127.0.0.1:7545	AUTOMINING	UPGRAD_KYC	SWITCH

← BACK

TX 0x1336d4aeb248dba8ed96432b0aed0cf125bb9bdc12b99b15f8cc8b64cfc5b381

SENDER ADDRESS
0xC61B4a8c9733cdF7e105e4C57219C08FE6ccf991

TO CONTRACT ADDRESS
0x915D6E367a35646a23882cEF00B00FEdbe580B19

CONTR

VALUE
0.00 ETH

GAS USED
63994

GAS PRICE
20000000000

GAS LIMIT
6721975

MIN
64

TX DATA
0x58f1a736000000000000000000000020e97dc833826746c9324b4333c42d2d405d0648

CONTRACT

CONTRACT
KYC

ADDRESS
0x915D6E367a35646a23882cEF00B00FEdbe

FUNCTION
reportSuspectedBank(suspiciousBankAddress: address)

INPUTS
0x20e97dc833826746c9324b4333c42d2d405d0648

EVENTS

NO EVENTS