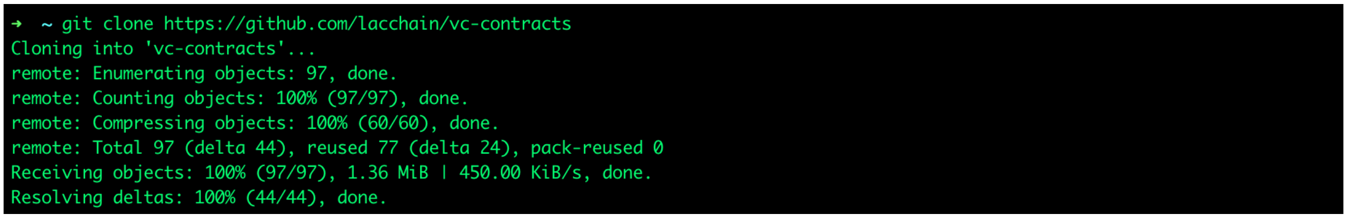
Deploy Credential Registry

In order to use the Credential Registry as a decentralized credential registration and verification method, it is necessary to clone the repository that contains the smart contracts and install some additional tools. Below are the steps to follow to have an environment to make the correct deployment.

1. To clone the repository, execute the following command:

```
$ git clone https://github.com/lacchain/vc-contracts
```

The output of the command should download the contracts folder from the repository, as shown in the following image:

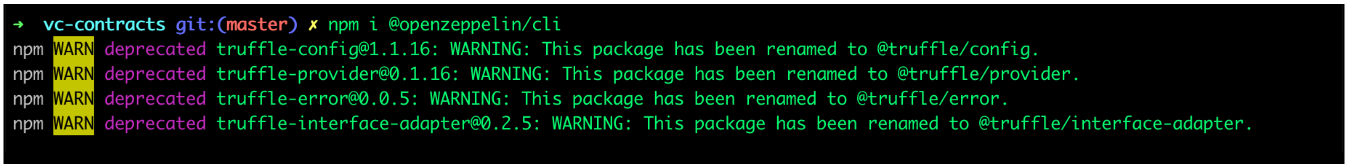


```
➜  ~ git clone https://github.com/lacchain/vc-contracts
Cloning into 'vc-contracts'...
remote: Enumerating objects: 97, done.
remote: Counting objects: 100% (97/97), done.
remote: Compressing objects: 100% (60/60), done.
remote: Total 97 (delta 44), reused 77 (delta 24), pack-reused 0
Receiving objects: 100% (97/97), 1.36 MiB | 450.00 KiB/s, done.
Resolving deltas: 100% (44/44), done.
```

2. Once the repository is cloned, we proceed to deploy the smart contracts using the openzeppelin command line tool. To do this, the following command must be executed:

```
$ npm i @openzeppelin/cli
```

The above will install the openzeppelin CLI in the folder where the command is run:



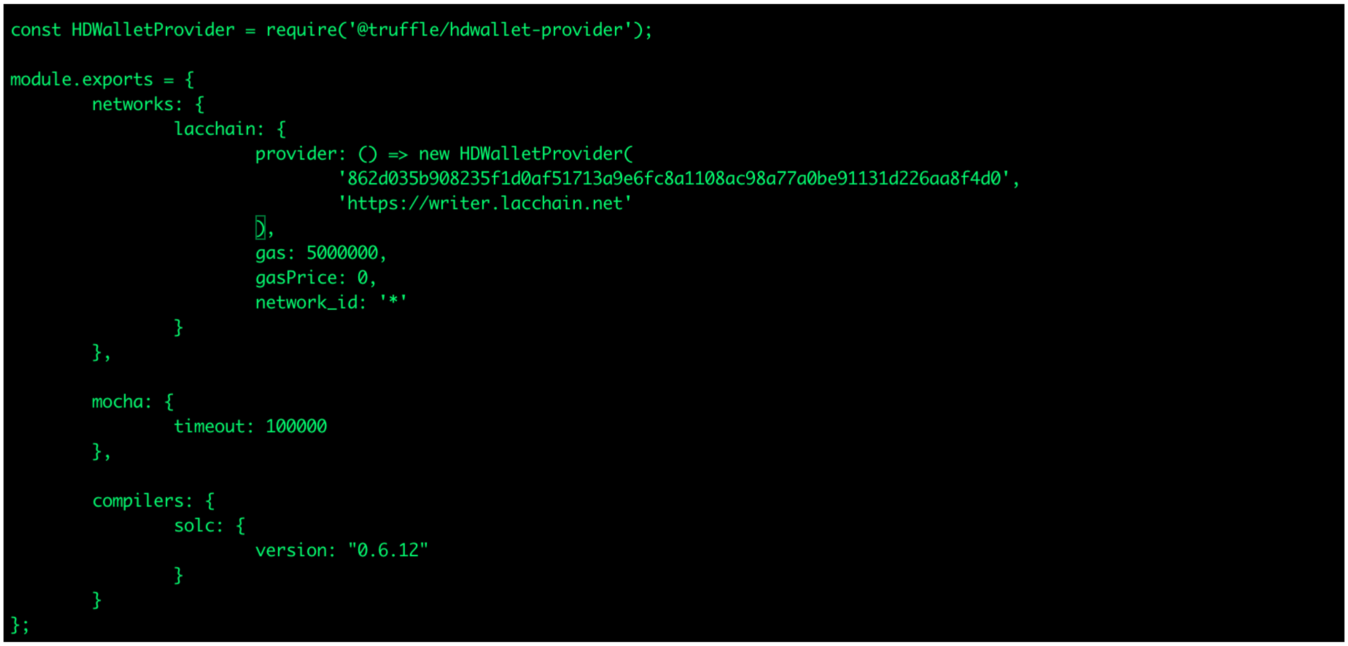
```
➜  vc-contracts git:(master) ✗ npm i @openzeppelin/cli
npm WARN deprecated truffle-config@1.1.16: WARNING: This package has been renamed to @truffle/config.
npm WARN deprecated truffle-provider@0.1.16: WARNING: This package has been renamed to @truffle/provider.
npm WARN deprecated truffle-error@0.0.5: WARNING: This package has been renamed to @truffle/error.
npm WARN deprecated truffle-interface-adapter@0.2.5: WARNING: This package has been renamed to @truffle/interface-adapter.
```

Note: If desired, it is possible to install the tool globally by adding the -g flag to the previous command, which will allow executing the openzeppelin command line from any other project.

3. Once the OpenZeppelin CLI is installed, it is necessary to edit the network configuration to be used for the deployment. Inside the repository we rename the example configuration file called truffle-config.default to truffle-config.js

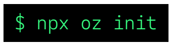
```
$ mv truffle-config.default truffle-config.js
```

And we edit the truffle-config.js file to include the LACChain network configuration. Consider the following code:



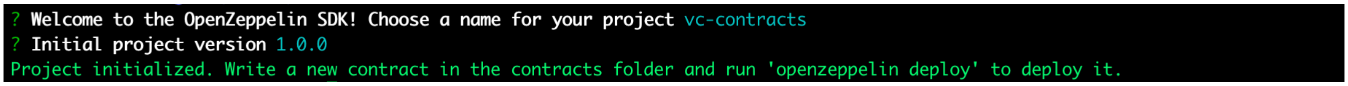
```
const HDWalletProvider = require('@truffle/hdwallet-provider');

module.exports = {
        networks: {
                lacchain: {
                        provider: () => new HDWalletProvider(
                                '862d035b908235f1d0af51713a9e6fc8a1108ac98a77a0be91131d226aa8f4d0',
                                'https://writer.lacchain.net'
                        ),
                        gas: 5000000,
                        gasPrice: 0,
                        network_id: '*'
                }
        },

        mocha: {
                timeout: 100000
        },

        compilers: {
                solc: {
                        version: "0.6.12"
                }
        }
};
```

4. Once the truffle-config.js file has been saved, we proceed to initialize the OpenZeppelin project using the following command:



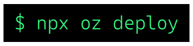
```
$ npx oz init
```

The command will request a name to the project: which is usually the same name as the repository and the version: which is normally 1.0.0.



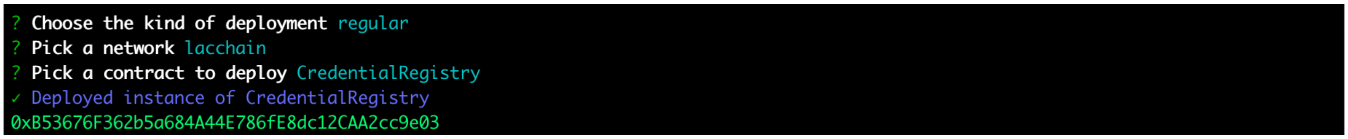
```
? Welcome to the OpenZeppelin SDK! Choose a name for your project vc-contracts
? Initial project version 1.0.0
Project initialized. Write a new contract in the contracts folder and run 'openzeppelin deploy' to deploy it.
```

5. After initializing the OpenZeppelin project it is possible to deploy the CredentialRegistry contract with the following command:



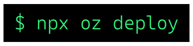
```
$ npx oz deploy
```

The above command will invoke the openzeppelin CLI that has been installed over the directory. If the tool was installed globally, the npx prefix can be omitted. When deploying the contract, OpenZeppelin will ask us to select the type of deployment: regular, the network: lacchain, and the contract to deploy: CredentialRegistry, as shown below:



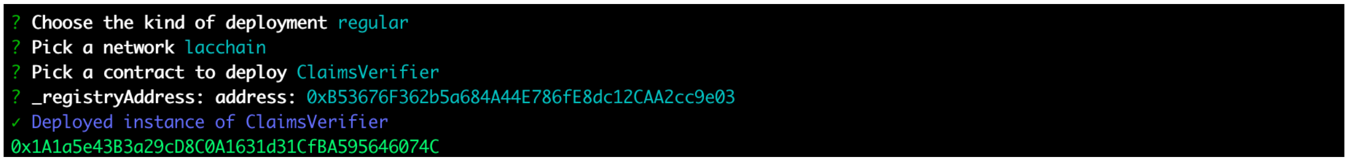
```
? Choose the kind of deployment regular
? Pick a network lacchain
? Pick a contract to deploy CredentialRegistry
✓ Deployed instance of CredentialRegistry
0xB53676F362b5a684A44E786fE8dc12CAA2cc9e03
```

6. After deploying the CredentialRegistry, now we are going to deploy the Smart Contract ClaimsVerifier, which is the contract in charge of interacting with the applications. We run the following command again:



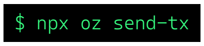
```
$ npx oz deploy
```

Selecting the same type of deployment and network, now we select the ClaimsVerifier contract and put the address of the CredentialRegistry generated in the previous step as shown in the following image:



```
? Choose the kind of deployment regular
? Pick a network lacchain
? Pick a contract to deploy ClaimsVerifier
? _registryAddress: address: 0xB53676F362b5a684A44E786fE8dc12CAA2cc9e03
✓ Deployed instance of ClaimsVerifier
0x1A1a5e43B3a29cD8C0A1631d31CfBA595646074C
```

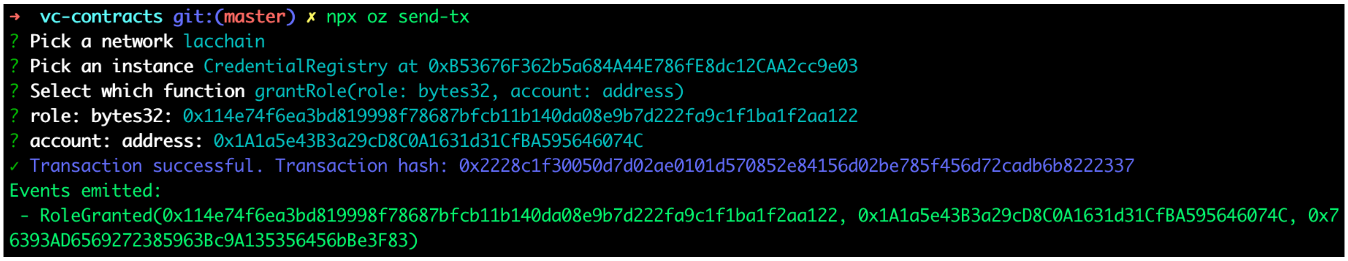
7. Because smart contracts make use of the OpenZeppelin Access Control System and the ClaimsVerifier works as a Facade of the CredentialRegistry, it is necessary to give the ClaimsVerifier permission to interact with the CredentialRegistry by assigning the address of the ClaimsVerifier with the role issuer within the CredentialRegistry. To assign the role to the contract, you can use the OZ CLI using the following command:



```
$ npx oz send-tx
```

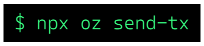
To execute the command, the following parameters are used:

- **network**: lacchain
- **instance**: CredentialRegistry
- **function**: grantRole
- **role**: 0x114e74f6ea3bd819998f78687bfcb11b140da08e9b7d222fa9c1f1ba1f2aa122
- **account**: the ClaimsVerifier address



```
➜  vc-contracts git:(master) ✗ npx oz send-tx
? Pick a network lacchain
? Pick an instance CredentialRegistry at 0xB53676F362b5a684A44E786fE8dc12CAA2cc9e03
? Select which function grantRole(role: bytes32, account: address)
? role: bytes32: 0x114e74f6ea3bd819998f78687bfcb11b140da08e9b7d222fa9c1f1ba1f2aa122
? account: address: 0x1A1a5e43B3a29cD8C0A1631d31CfBA595646074C
✓ Transaction successful. Transaction hash: 0x2228c1f30050d7d02ae0101d570852e84156d02be785f456d72cadb6b8222337
Events emitted:
 - RoleGranted(0x114e74f6ea3bd819998f78687bfcb11b140da08e9b7d222fa9c1f1ba1f2aa122, 0x1A1a5e43B3a29cD8C0A1631d31CfBA595646074C, 0x7
6393AD6569272385963Bc9A135356456bBe3F83)
```

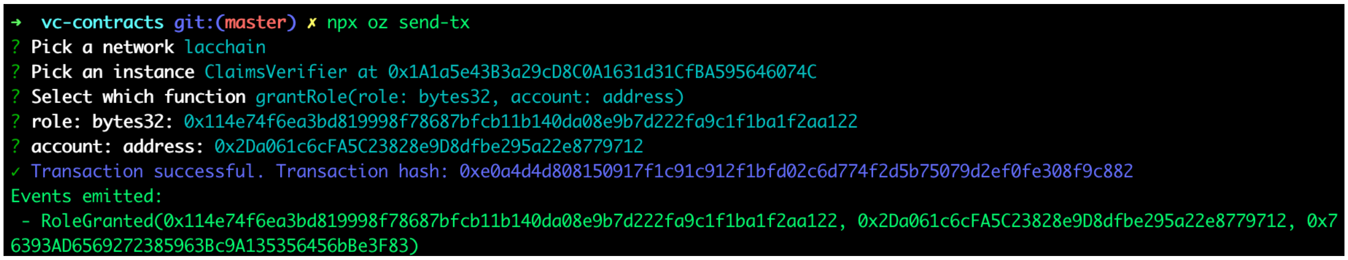
8. Similarly, you need to assign the issuer accounts to the ClaimsVerifier contract using the same command:



```
$ npx oz send-tx
```

To execute the command, the following parameters are used:

- **network**: lacchain
- **instance**: ClaimsVerifier
- **function**: grantRole
- **role**: 0x114e74f6ea3bd819998f78687bfcb11b140da08e9b7d222fa9c1f1ba1f2aa122
- **account**: la dirección del issuer de la VC



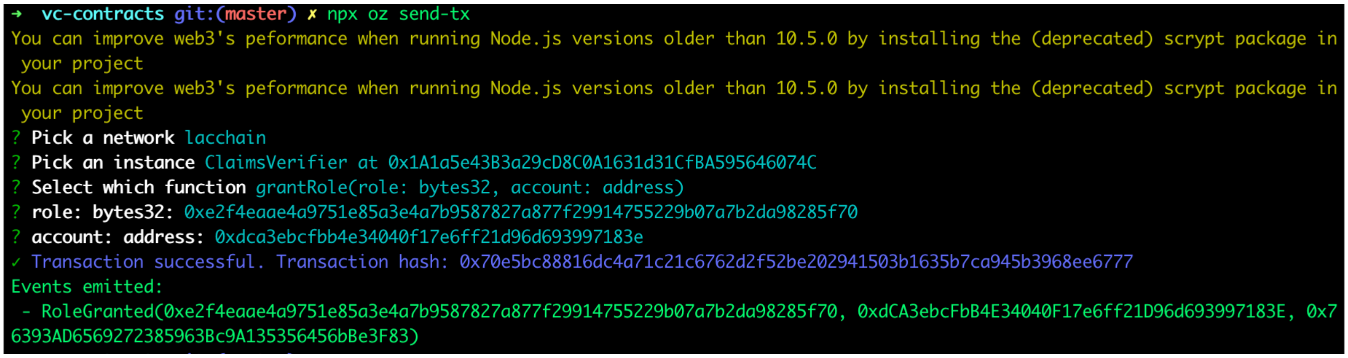
```
➜  vc-contracts git:(master) ✗ npx oz send-tx
? Pick a network lacchain
? Pick an instance ClaimsVerifier at 0x1A1a5e43B3a29cD8C0A1631d31CfBA595646074C
? Select which function grantRole(role: bytes32, account: address)
? role: bytes32: 0x114e74f6ea3bd819998f78687bfcb11b140da08e9b7d222fa9c1f1ba1f2aa122
? account: address: 0x2Da061c6cFA5C23828e9D8dfbe295a22e8779712
✓ Transaction successful. Transaction hash: 0xe0a4d4d808150917f1c91c912f1bfd02c6d774f2d5b75079d2ef0fe308f9c882
Events emitted:
 - RoleGranted(0x114e74f6ea3bd819998f78687bfcb11b140da08e9b7d222fa9c1f1ba1f2aa122, 0x2Da061c6cFA5C23828e9D8dfbe295a22e8779712, 0x7
6393AD6569272385963Bc9A135356456bBe3F83)
```

9. Optionally, ClaimsVerifier contract accounts can be assigned as signers using the same command:

```
$ npx oz send-tx
```

To execute the command, the following parameters are used:

- **network**: lacchain
- **instance**: ClaimsVerifier
- **function**: grantRole
- **role**: 0xe2f4eaae4a9751e85a3e4a7b9587827a877f29914755229b07a7b2da98285f70
- **account**: the issuer address



```
➜  vc-contracts git:(master) ✗ npx oz send-tx
You can improve web3's peformance when running Node.js versions older than 10.5.0 by installing the (deprecated) scrypt package in
 your project
You can improve web3's peformance when running Node.js versions older than 10.5.0 by installing the (deprecated) scrypt package in
 your project
? Pick a network lacchain
? Pick an instance ClaimsVerifier at 0x1A1a5e43B3a29cD8C0A1631d31CfBA595646074C
? Select which function grantRole(role: bytes32, account: address)
? role: bytes32: 0xe2f4eaae4a9751e85a3e4a7b9587827a877f29914755229b07a7b2da98285f70
? account: address: 0xdca3ebcfbb4e34040f17e6ff21d96d693997183e
✓ Transaction successful. Transaction hash: 0x70e5bc88816dc4a71c21c6762d2f52be202941503b1635b7ca945b3968ee6777
Events emitted:
 - RoleGranted(0xe2f4eaae4a9751e85a3e4a7b9587827a877f29914755229b07a7b2da98285f70, 0xdCA3ebcFbB4E34040F17e6ff21D96d693997183E, 0x7
6393AD6569272385963Bc9A135356456bBe3F83)
```

Register Verifiable Credential

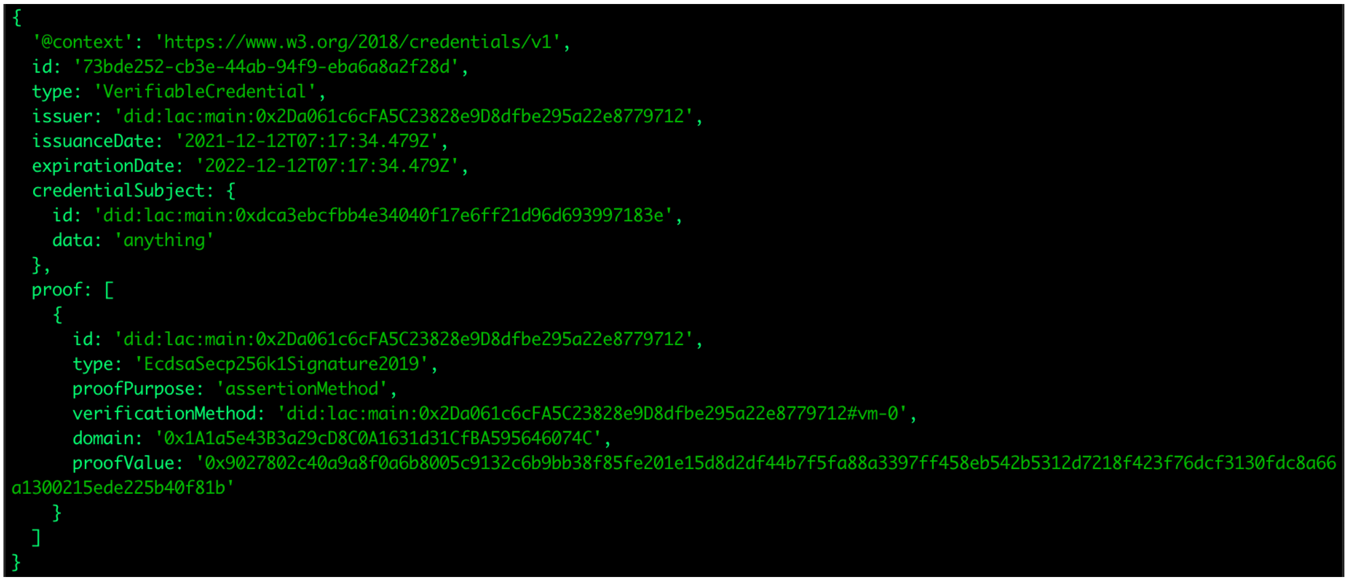
Once the Smart Contracts have been deployed and the roles configured, a Credential can now be registered, signed and verified. To register a Credential it is necessary to generate some digital signatures based on EIP 712 using code in NodeJS, as shown below:

```
import ethers from "ethers";
import moment from "moment";
import { CLAIMS_VERIFIER_ABI, getCredentialHash, signCredential } from "@lacchain/vc-contracts-utils";

const CLAIMS_VERIFIER_ADDRESS = "0x1A1a5e43B3a29cD8C0A1631d31CfBA595646074C";
const ISSUER_ADDRESS = "0x2Da061c6cFA5C23828e9D8dfbe295a22e8779712";
const ISSUER_PRIVATE_KEY = "60090a13d72f682c03db585bf6c3a296600b5d50598a9ceef3291534dede6bea";

const vc = {
         "@context": "https:// www.w3.org/2018/credentials/v1",
         id: "73bde252-cb3e-44ab-94f9-eba6a8a2f28d",
         type: "VerifiableCredential",
         issuer: `did:lac:main:${ISSUER_ADDRESS}`,
         issuanceDate: '2021-12-12T07:17:34.479Z',
         expirationDate: '2022-12-12T07:17:34.479Z',

         credentialSubject: {
                  id: `did:lac:main:0xdca3ebcfbb4e34040f17e6ff21d96d693997183e`,
                  data: 'anything'
         },
         proof: []
}

Async function register() {
         const claimsVerifier = new ethers.Contract( CLAIMS_VERIFIER_ADDRESS, CLAIMS_VERIFIER_ABI,
                  new ethers.Wallet( '0x' + ISSUER_PRIVATE_KEY, new ethers.providers.JsonRpcProvider( "https://
writer.lacchain.net" ) ) );

         const credentialHash = getCredentialHash( vc, ISSUER_ADDRESS, CLAIMS_VERIFIER_ADDRESS );
         const signature = await signCredential( credentialHash, ISSUER_PRIVATE_KEY );

         await claimsVerifier.registerCredential( 'did:lac:main:0xdca3ebcfbb4e34040f17e6ff21d96d693997183e',
credentialHash,
                  Math.round( moment( vc.issuanceDate ).valueOf() / 1000 ),
                  Math.round( moment( vc.expirationDate ).valueOf() / 1000 ),
                  signature, { from: ISSUER_ADDRESS } );

         vc.proof.push( {
                  id: vc.issuer,
                  type: "EcdsaSecp256k1Signature2019",
                  proofPurpose: "assertionMethod",
                  verificationMethod: `${vc.issuer}#vm-0`,
                  domain: CLAIMS_VERIFIER_ADDRESS,
                  proofValue: signature
         } );

         console.log( vc );
```

To execute the above code you have to execute the following commands:

```
$ npm install ethers
$ npm install moments
$ npm install @lacchain/vc-contracts-utils
$ node --experimental-modules index.mjs
```

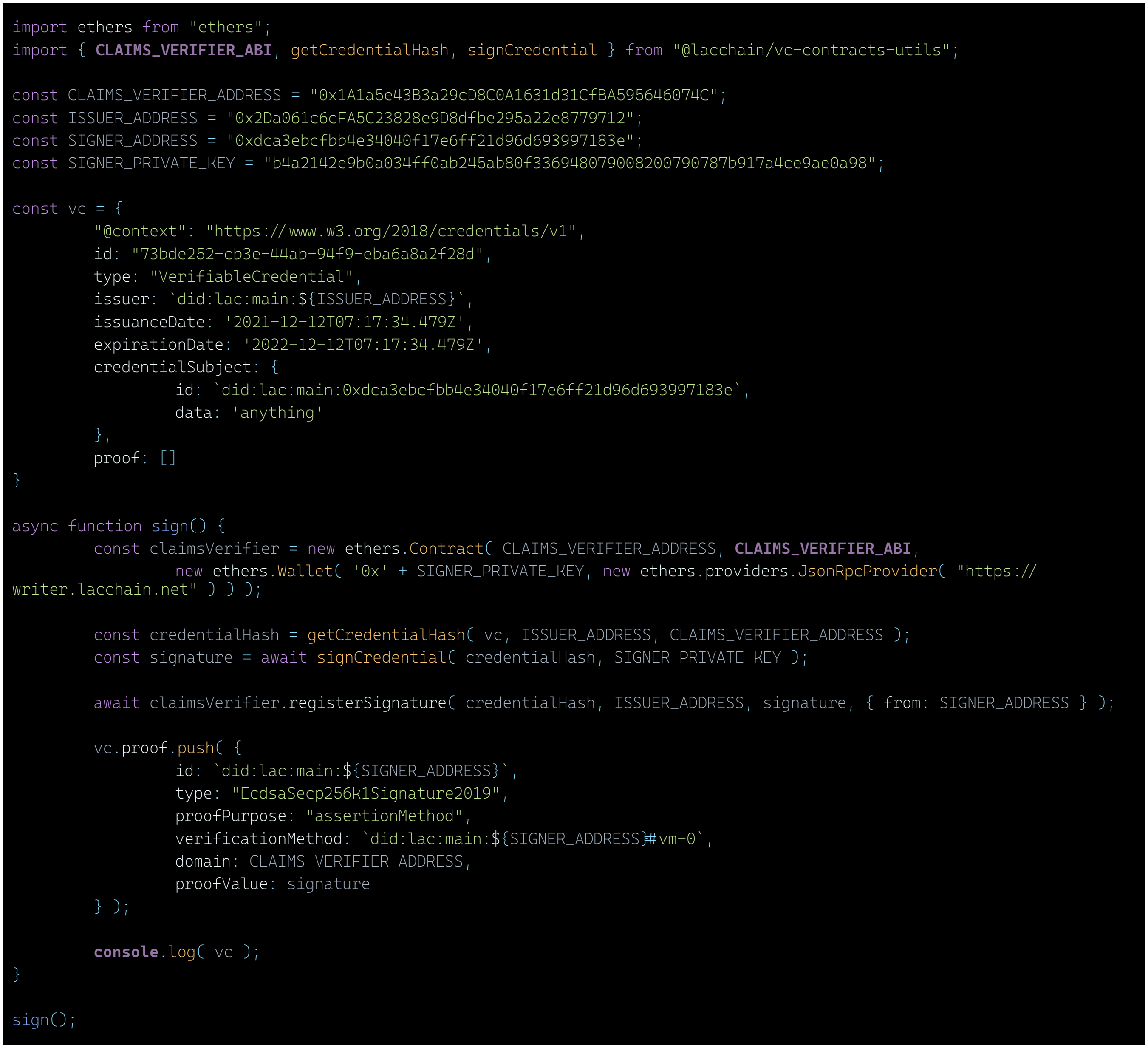
The result of the execution will give us the Verifiable Credential with the signature of the issuer, as shown in the following image:



```
{
  '@context': 'https://www.w3.org/2018/credentials/v1',
  id: '73bde252-cb3e-44ab-94f9-eba6a8a2f28d',
  type: 'VerifiableCredential',
  issuer: 'did:lac:main:0x2Da061c6cFA5C23828e9D8dfbe295a22e8779712',
  issuanceDate: '2021-12-12T07:17:34.479Z',
  expirationDate: '2022-12-12T07:17:34.479Z',
  credentialSubject: {
    id: 'did:lac:main:0xdca3ebcfbb4e34040f17e6ff21d96d693997183e',
    data: 'anything'
  },
  proof: [
    {
      id: 'did:lac:main:0x2Da061c6cFA5C23828e9D8dfbe295a22e8779712',
      type: 'EcdsaSecp256k1Signature2019',
      proofPurpose: 'assertionMethod',
      verificationMethod: 'did:lac:main:0x2Da061c6cFA5C23828e9D8dfbe295a22e8779712#vm-0',
      domain: '0x1A1a5e43B3a29cD8C0A1631d31CfBA595646074C',
      proofValue: '0x9027802c40a9a8f0a6b8005c9132c6b9bb38f85fe201e15d8d2df44b7f5fa88a3397ff458eb542b5312d7218f423f76dcf3130fdc8a66
a1300215ede225b40f81b'
    }
  ]
}
```

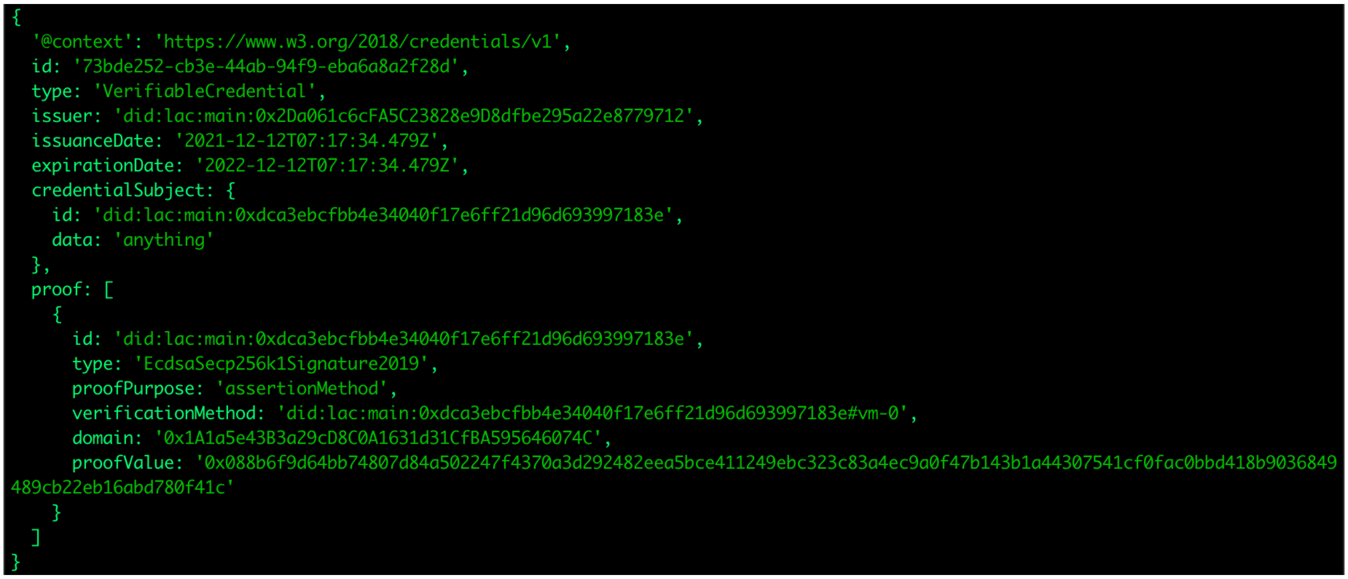
Add additional signature to Verifiable Credential

After the credential has been registered it is necessary that it be signed by all the Signers registered in ClaimsVerifier Smart Contract. It is possible to register a signature of a Signer using the following code:



```
import ethers from "ethers";
import { CLAIMS_VERIFIER_ABI, getCredentialHash, signCredential } from "@lacchain/vc-contracts-utils";

const CLAIMS_VERIFIER_ADDRESS = "0x1A1a5e43B3a29cD8C0A1631d31CfBA595646074C";
const ISSUER_ADDRESS = "0x2Da061c6cFA5C23828e9D8dfbe295a22e8779712";
const SIGNER_ADDRESS = "0xdca3ebcfbb4e34040f17e6ff21d96d693997183e";
const SIGNER_PRIVATE_KEY = "b4a2142e9b0a034ff0ab245ab80f336948079008200790787b917a4ce9ae0a98";

const vc = {
        "@context": "https://www.w3.org/2018/credentials/v1",
        id: "73bde252-cb3e-44ab-94f9-eba6a8a2f28d",
        type: "VerifiableCredential",
        issuer: `did:lac:main:${ISSUER_ADDRESS}`,
        issuanceDate: '2021-12-12T07:17:34.479Z',
        expirationDate: '2022-12-12T07:17:34.479Z',
        credentialSubject: {
                id: `did:lac:main:0xdca3ebcfbb4e34040f17e6ff21d96d693997183e`,
                data: 'anything'
        },
        proof: []
}

async function sign() {
        const claimsVerifier = new ethers.Contract( CLAIMS_VERIFIER_ADDRESS, CLAIMS_VERIFIER_ABI,
                new ethers.Wallet( '0x' + SIGNER_PRIVATE_KEY, new ethers.providers.JsonRpcProvider( "https://
writer.lacchain.net" ) ) );

        const credentialHash = getCredentialHash( vc, ISSUER_ADDRESS, CLAIMS_VERIFIER_ADDRESS );
        const signature = await signCredential( credentialHash, SIGNER_PRIVATE_KEY );

        await claimsVerifier.registerSignature( credentialHash, ISSUER_ADDRESS, signature, { from: SIGNER_ADDRESS } );

        vc.proof.push( {
                id: `did:lac:main:${SIGNER_ADDRESS}`,
                type: "EcdsaSecp256k1Signature2019",
                proofPurpose: "assertionMethod",
                verificationMethod: `did:lac:main:${SIGNER_ADDRESS}#vm-0`,
                domain: CLAIMS_VERIFIER_ADDRESS,
                proofValue: signature
        } );

        console.log( vc );
}

sign();
```

The result of the execution will give us the Verifiable Credential with the signature of the signer in the poof section, as shown in the following image:



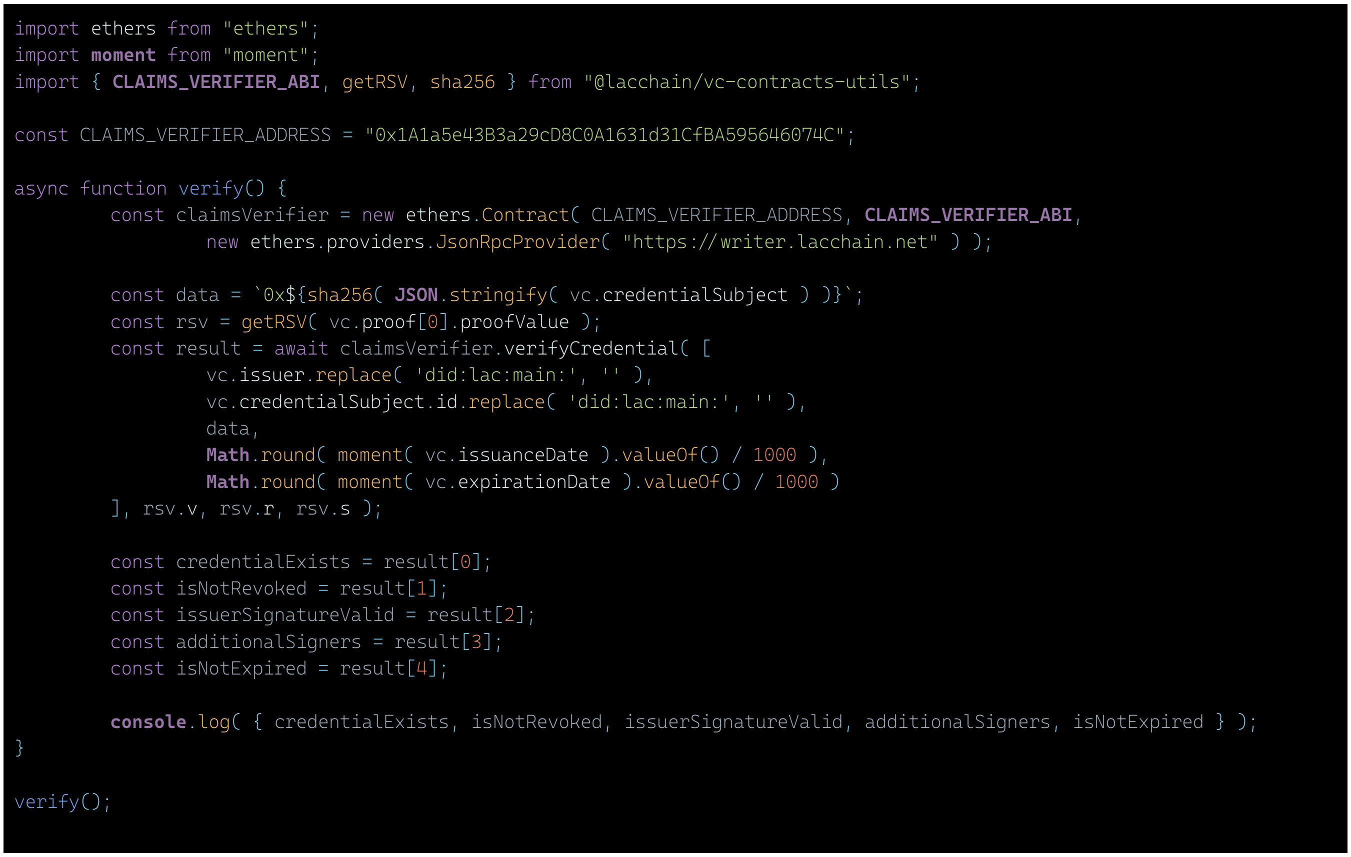
```
{
  '@context': 'https://www.w3.org/2018/credentials/v1',
  id: '73bde252-cb3e-44ab-94f9-eba6a8a2f28d',
  type: 'VerifiableCredential',
  issuer: 'did:lac:main:0x2Da061c6cFA5C23828e9D8dfbe295a22e8779712',
  issuanceDate: '2021-12-12T07:17:34.479Z',
  expirationDate: '2022-12-12T07:17:34.479Z',
  credentialSubject: {
    id: 'did:lac:main:0xdca3ebcfbb4e34040f17e6ff21d96d693997183e',
    data: 'anything'
  },
  proof: [
    {
      id: 'did:lac:main:0xdca3ebcfbb4e34040f17e6ff21d96d693997183e',
      type: 'EcdsaSecp256k1Signature2019',
      proofPurpose: 'assertionMethod',
      verificationMethod: 'did:lac:main:0xdca3ebcfbb4e34040f17e6ff21d96d693997183e#vm-0',
      domain: '0x1A1a5e43B3a29cD8C0A1631d31CfBA595646074C',
      proofValue: '0x088b6f9d64bb74807d84a502247f4370a3d292482eea5bce411249ebc323c83a4ec9a0f47b143b1a44307541cf0fac0bbd418b9036849
489cb22eb16abd780f41c'
    }
  ]
}
```

Verify a Verifiable Credential

Once the Credential is registered and signed, the proofs of the issuer and the signers must be concatenated in the same proof array, as shown below:

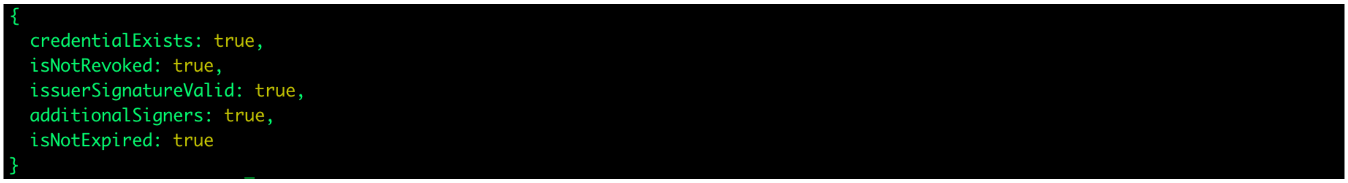
```
const vc = {
        '@context': 'https://www.w3.org/2018/credentials/v1',
        id: '73bde252-cb3e-44ab-94f9-eba6a8a2f28d',
        type: 'VerifiableCredential',
        issuer: 'did:lac:main:0x2Da061c6cFA5C23828e9D8dfbe295a22e8779712',
        issuanceDate: '2021-12-12T07:17:34.479Z',
        expirationDate: '2022-12-12T07:17:34.479Z',
        credentialSubject: {
                id: 'did:lac:main:0xdca3ebcfbb4e34040f17e6ff21d96d693997183e',
                data: 'anything'
        },
        proof: [
                {
                        id: 'did:lac:main:0x2Da061c6cFA5C23828e9D8dfbe295a22e8779712',
                        type: 'EcdsaSecp256k1Signature2019',
                        proofPurpose: 'assertionMethod',
                        verificationMethod: 'did:lac:main:0x2Da061c6cFA5C23828e9D8dfbe295a22e8779712#vm-0',
                        domain: '0x1A1a5e43B3a29cD8C0A1631d31CfBA595646074C',
                        proofValue:
'0x9027802c40a9a8f0a6b8005c9132c6b9bb38f85fe201e15d8d2df44b7f5fa88a3397ff458eb542b5312d7218f423f76dcf3130fdc8a66a1300215
ede225b40f81b'
                },
                {
                        id: 'did:lac:main:0xdca3ebcfbb4e34040f17e6ff21d96d693997183e',
                        type: 'EcdsaSecp256k1Signature2019',
                        proofPurpose: 'assertionMethod',
                        verificationMethod: 'did:lac:main:0xdca3ebcfbb4e34040f17e6ff21d96d693997183e#vm-0',
                        domain: '0x1A1a5e43B3a29cD8C0A1631d31CfBA595646074C',
                        proofValue:
'0x088b6f9d64bb74807d84a502247f4370a3d292482eea5bce411249ebc323c83a4ec9a0f47b143b1a44307541cf0fac0bbd418b9036849489cb22e
b16abd780f41c'
                }
        ]
}
```

The function to verify a VC is shown in the following code:



```
import ethers from "ethers";
import moment from "moment";
import { CLAIMS_VERIFIER_ABI, getRSV, sha256 } from "@lacchain/vc-contracts-utils";

const CLAIMS_VERIFIER_ADDRESS = "0x1A1a5e43B3a29cD8C0A1631d31CfBA595646074C";

async function verify() {
	const claimsVerifier = new ethers.Contract( CLAIMS_VERIFIER_ADDRESS, CLAIMS_VERIFIER_ABI,
		new ethers.providers.JsonRpcProvider( "https://writer.lacchain.net" ) );

	const data = `0x${sha256( JSON.stringify( vc.credentialSubject ) )}`;
	const rsv = getRSV( vc.proof[0].proofValue );
	const result = await claimsVerifier.verifyCredential( [
		vc.issuer.replace( 'did:lac:main:', '' ),
		vc.credentialSubject.id.replace( 'did:lac:main:', '' ),
		data,
		Math.round( moment( vc.issuanceDate ).valueOf() / 1000 ),
		Math.round( moment( vc.expirationDate ).valueOf() / 1000 )
	], rsv.v, rsv.r, rsv.s );

	const credentialExists = result[0];
	const isNotRevoked = result[1];
	const issuerSignatureValid = result[2];
	const additionalSigners = result[3];
	const isNotExpired = result[4];

	console.log( { credentialExists, isNotRevoked, issuerSignatureValid, additionalSigners, isNotExpired } );
}

verify();
```

The output from executing the above code is as follows:



```
{
  credentialExists: true,
  isNotRevoked: true,
  issuerSignatureValid: true,
  additionalSigners: true,
  isNotExpired: true
}
```

In the event that additional signers have been defined, the following code must be executed to verify the signature of each one of them individually:

```
import ethers from "ethers";
import moment from "moment";
import { CLAIMS_VERIFIER_ABI, sha256 } from "@lacchain/vc-contracts-utils";

const CLAIMS_VERIFIER_ADDRESS = "0x1A1a5e43B3a29cD8C0A1631d31CfBA595646074C";

async function verifySignature() {
        const claimsVerifier = new ethers.Contract( CLAIMS_VERIFIER_ADDRESS, CLAIMS_VERIFIER_ABI,
                new ethers.providers.JsonRpcProvider( "https://writer.lacchain.net" ) );

        const data = `0x${sha256( JSON.stringify( vc.credentialSubject ) )}`;

        const isValidSignature = await claimsVerifier.verifySigner( [
                vc.issuer.replace( 'did:lac:main:', '' ),
                vc.credentialSubject.id.replace( 'did:lac:main:', '' ),
                data,
                Math.round( moment( vc.issuanceDate ).valueOf() / 1000 ),
                Math.round( moment( vc.expirationDate ).valueOf() / 1000 )
        ], vc.proof[1].proofValue );


        console.log( { isValidSignature } );
}
```

If the signature is correct, the output of the above code is as follows:

```
{ isValidSignature: true }
```

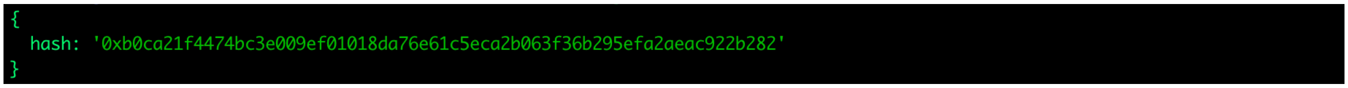
The process must be run for each additional signature.

Revoke a Verifiable Credential

Finally, as part of the process, it is possible to revoke a VC by invoking the revokeCredential function of the Smart Contract using the following code:

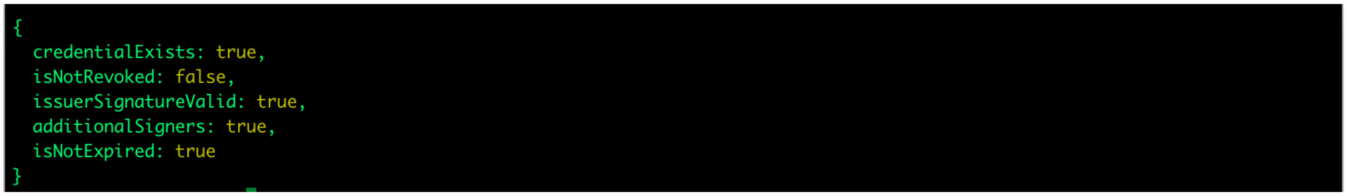
```
import ethers from "ethers";
import { CREDENTIAL_REGISTRY_ABI, getCredentialHash } from "@lacchain/vc-contracts-utils";

const CREDENTIAL_REGISTRY_ADDRESS = "0xB53676F362b5a684A44E786fE8dc12CAA2cc9e03";
const CLAIMS_VERIFIER_ADDRESS = "0x1A1a5e43B3a29cD8C0A1631d31CfBA595646074C";
const ISSUER_ADDRESS = "0x2Da061c6cFA5C23828e9D8dfbe295a22e8779712";
const ISSUER_PRIVATE_KEY = "60090a13d72f682c03db585bf6c3a296600b5d50598a9ceef329153 4dede6bea";


async function revoke() {
        const credentialRegistry = new ethers.Contract( CREDENTIAL_REGISTRY_ADDRESS, CREDENTIAL_REGISTRY_ABI,
                new ethers.Wallet( '0x' + ISSUER_PRIVATE_KEY, new ethers.providers.JsonRpcProvider( "https://
writer.lacchain.net" ) ) );

        const credentialHash = getCredentialHash( vc, ISSUER_ADDRESS, CLAIMS_VERIFIER_ADDRESS );

        const tx = await credentialRegistry.revokeCredential( credentialHash );

        console.log( { hash: tx.hash } );
}

revoke();
```

The result of the command execution only returns the hash of the transaction.



```
{
  hash: '0xb0ca21f4474bc3e009ef01018da76e61c5eca2b063f36b295efa2aeac922b282'
}
```

Once the credential is revoked, if we run the verification process again, it will give us the following result:



```
{
  credentialExists: true,
  isNotRevoked: false,
  issuerSignatureValid: true,
  additionalSigners: true,
  isNotExpired: true
}
```

The result indicates that the credential exists, the signatures are valid and it has not expired, but it is revoked (isNotRevoked: false)