

SecuWeb

Food Use Case

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Food Supply Chains

Issues within existing food supply chains (FSCs)

- Waste
- Fraud & counterfeit
- Delayed recall and interventions

Because existing FSC rely on manual processes, which are

- error-prone
- not tamper proof
- make authenticity hard to achieve

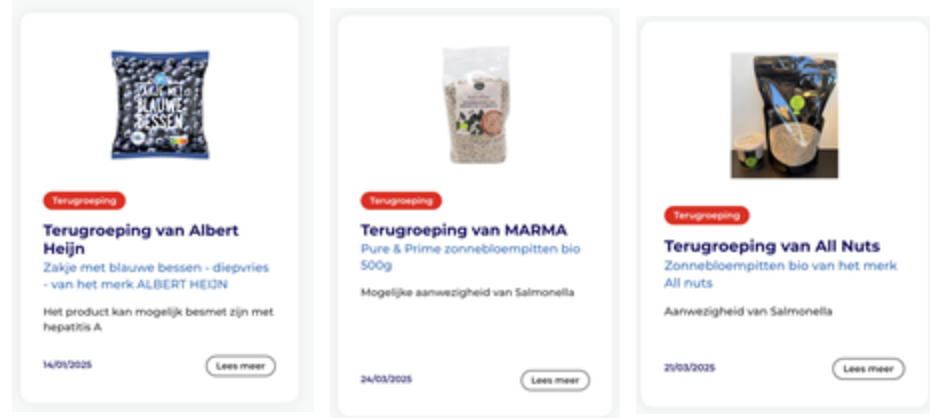
- Food Supply Chains
- **How can blockchain improve Food Supply Chains?**
- Open Challenges for BC-based solutions
- A hybrid approach is needed
- Solution
- Use Case: Food Recall
- Architecture
- Demo

How can the of blockchain improve FSCs?

Blockchains (BCs) can enable a **transparent** end-to-end FSC providing **traceability** of products, which increases **sustainability** and **operational efficiency** [1], because of:

- The ability to automatize (otherwise manual) processes (how: smart contracts)
- More efficient food recall processes
- The ability to optimize SCs to reduce food waste

Moreover, BC-based SCs can have a substantial impact on **health**, due to **improved quality assurance**, facilitating the prevention of distributing bad/unsafe products [4].



<https://favv-afsca.be/nl/producten>

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Open challenges for BC-based solutions

Public/permissionless BCs are slow (e.g., ETH transactions typically take $\pm 23\text{sec}$)

Generally, the more data on-chain, the slower the system becomes and, the higher the risk of privacy threats.

BCs shouldn't store all data, so where to should it be stored?

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A hybrid approach is needed

A hybrid approach that allows to balance the tradeoff between on and- off-chain data in a way that not only harnesses the features provided by a blockchain, but also extends them with additional features such as **data sovereignty** and **interoperability**.

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Solution

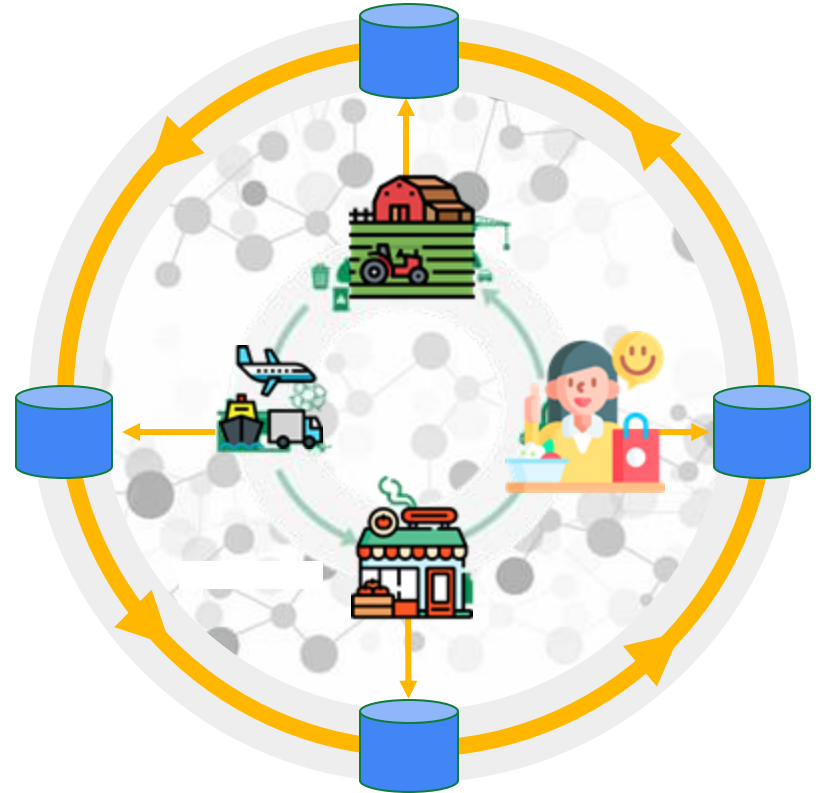
A hybrid approach that allows to balance the tradeoff between on and- off-chain data in a way that not only harnesses the features provided by a blockchain, but also extends them with additional features such as **data sovereignty** and **interoperability**.



Food Supply Chains (FSCs) need data flows

Information needs to flow between actors in a way that that increases **traceability**, **transparency**, and **efficiency** in FSCs.

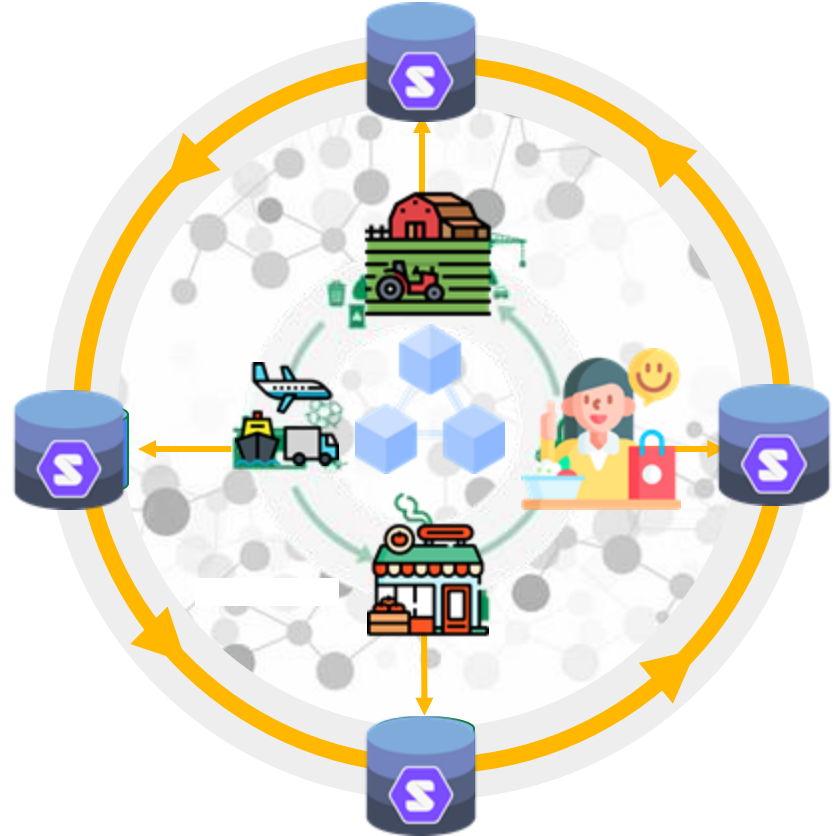
While the actors can **control** their data, and **trust** the data of others.



Food Supply Chains (FSCs) need data flows

Information needs to flow between actors in a way that that increases **traceability**, **transparency**, and **efficiency** in FSCs.

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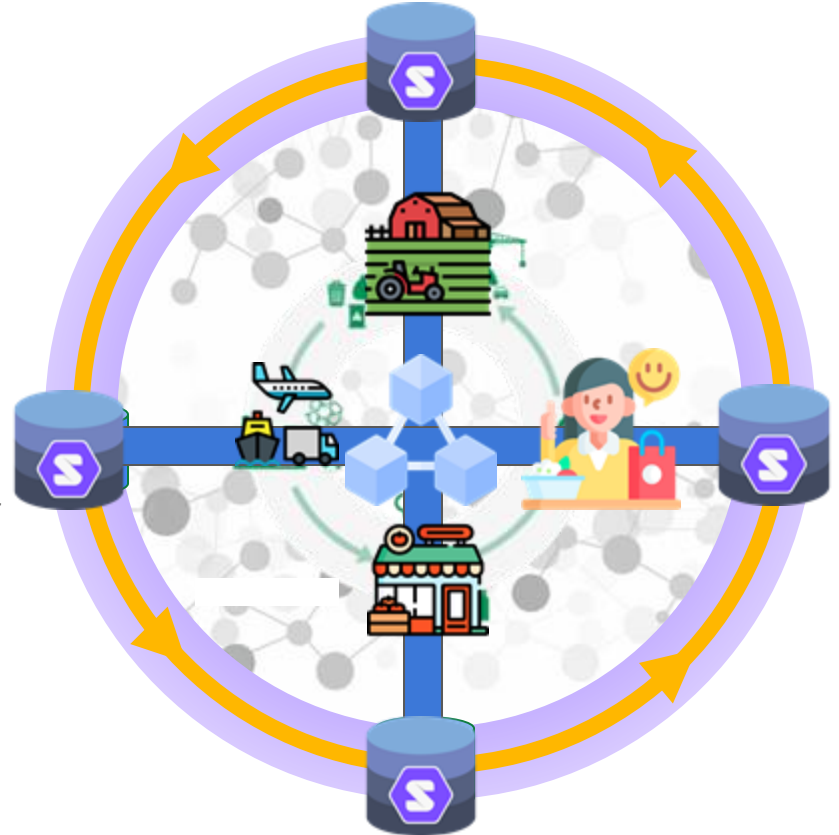
Food Supply Chains (FSCs) need decentralized data flows

Information needs to flow between actors in a way that that increases **traceability**, **transparency**, and **efficiency** in FSCs.

While the actors can **control their data** and **trust the data of others**.

By storing their data on a personal data store, or Solid Pod.

By verifying the **authenticity** and **integrity** of that data.

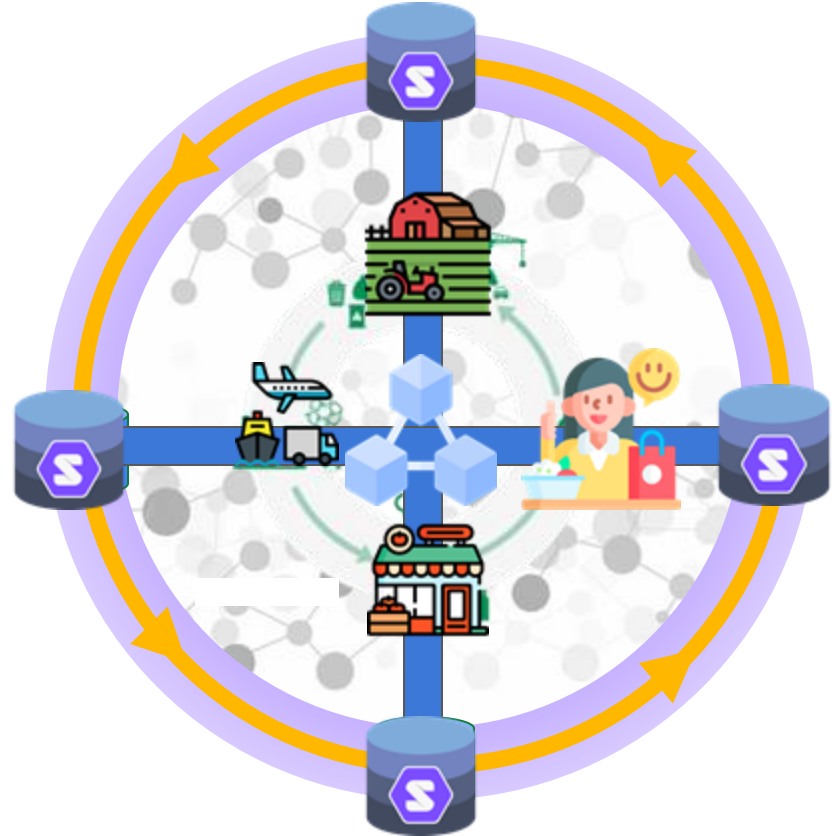


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Use case: Solid Food Recall

Prelims: Alice & Store Z are “Solid-enabled”.

1. Alice buys products X and Y at store Z.
At check-out, Alice’s Solid Pod is updated with the newly bought groceries.
2. An actor somewhere along the SC warns about product Y being contaminated with Salmonella.
3. Alice immediately receives a warning that her recently bought product Y is likely contaminated.



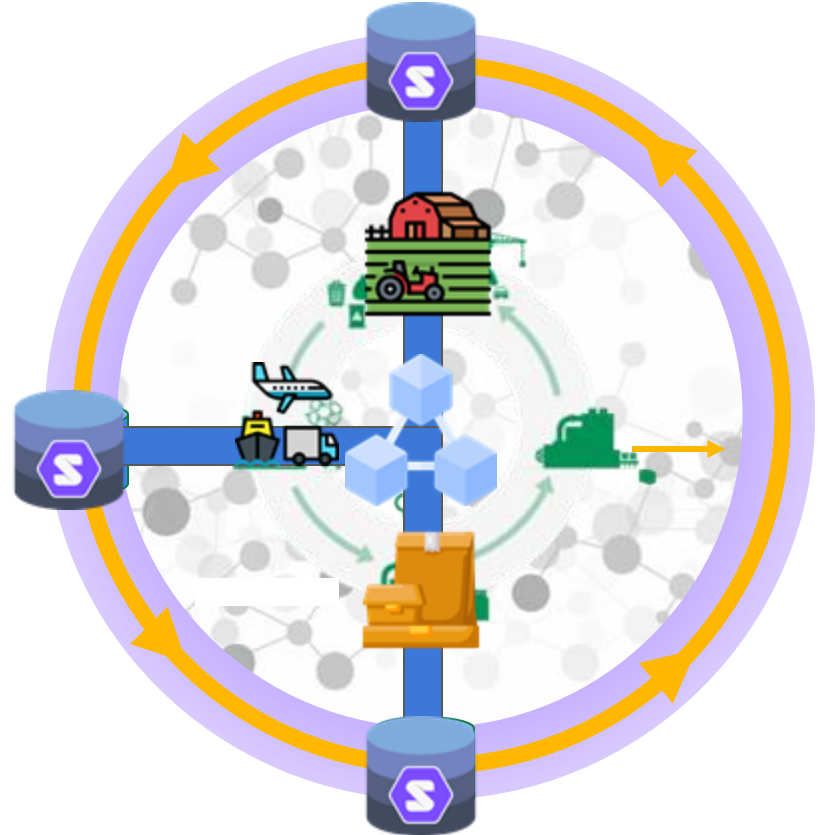
Use case: Product Shipping

A **Farmer** ships a product to a **Packager** using a **Transporter**.

The **Farmer** shares the product details with the **Packager**, but not with the **Transporter**.

The **Transporter** creates verifiable shipment records that are only readable by the actors involved (i.e., **Farmer** and **Packager**).

The **Packager** can read and verify the authenticity and data integrity of the received products.



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Architecture

WebIDs to identify actors within the Solid ecosystem.

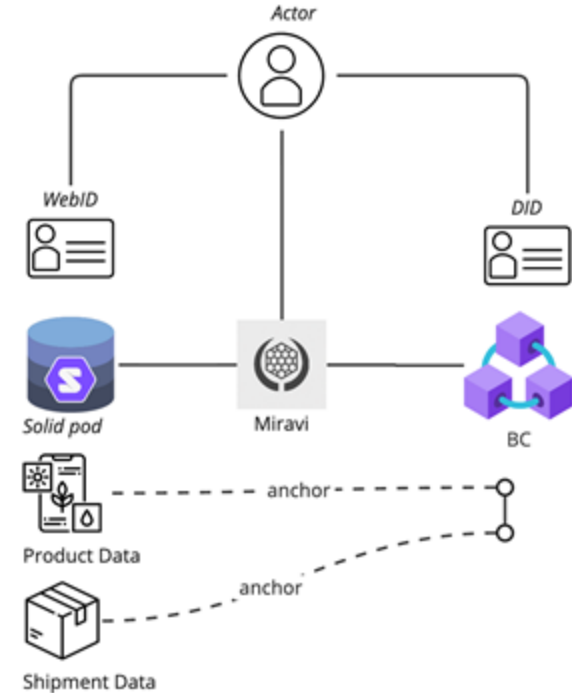
DIDs to identify actors and resources on the BC.

An actor's Solid Pod serves as off-chain data store that is solely under the control of the actor.

Data is encapsulated as a Verifiable Credential, which is stored on the actor's Solid Pod and anchored on the blockchain.

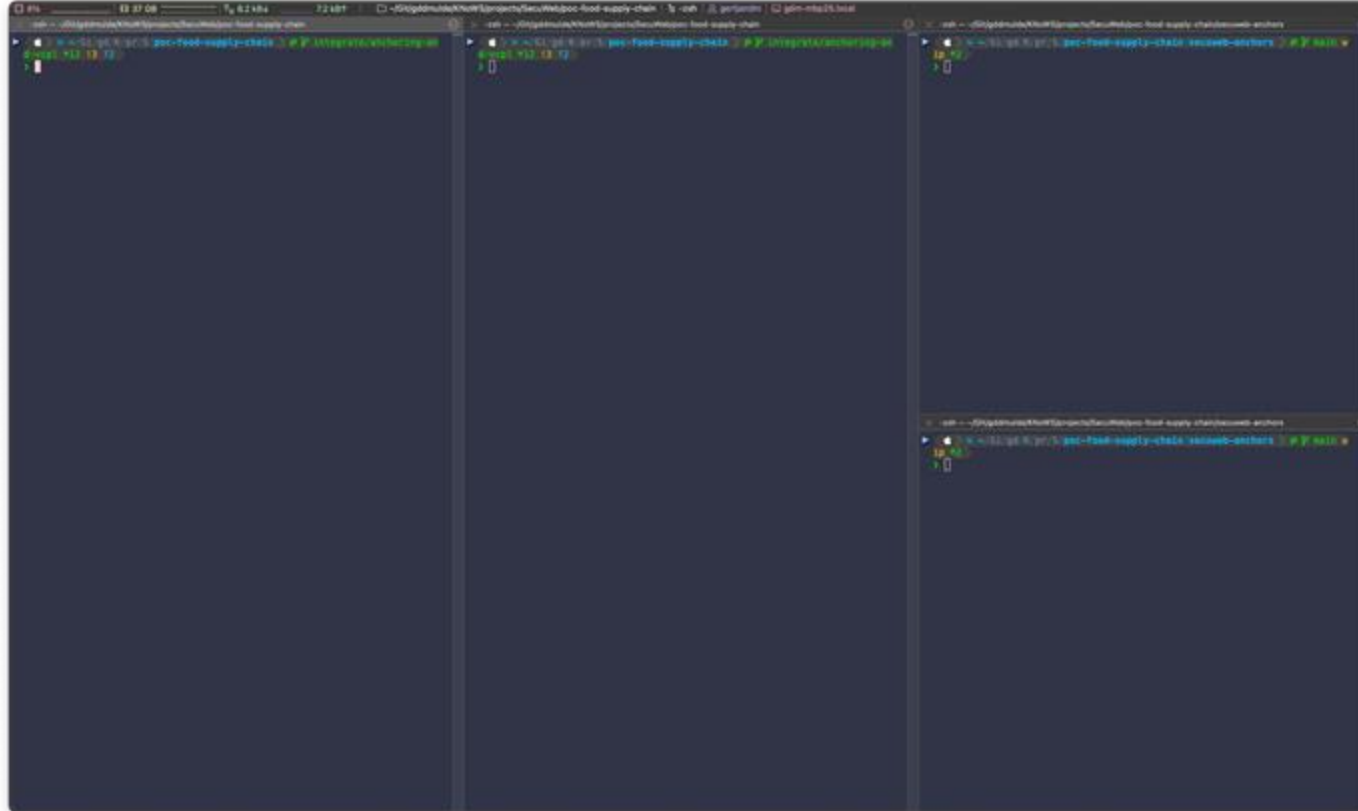
Miravi allows actors to

- 1) Query the decentrally stored data.
- 2) Verify the data's signature.
- 3) Verify the on-chain hash of the data.



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Demo setup



1. Set up Solid Pods
2. Set up blockchain
3. Store data as Verifiable Credential on the Solid Pods.
4. Anchor every Verifiable Credential on the blockchain.

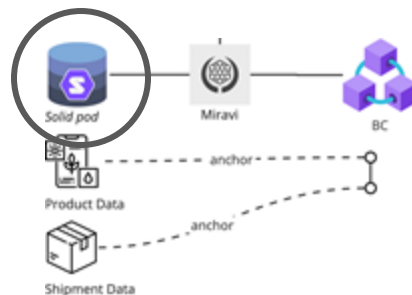


Demo setup

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npm run pod
> poc-food-supply-chain@0.0.0 pod
> community-solid-server --rootFilePath ./css/root --config ./css/css.json
  --seedConfig ./css/css-users.json

2025-11-14T04:11:27.745Z [Components.js] info: Initiating component discovery from /Users/gertjanm/Git/gddmide/WhomI/projects/SecuWeb/poc-food-supply-chain/node_modules/@solid/community-server/
2025-11-14T04:11:27.926Z [Components.js] info: Discovered 168 component packages within 2823 packages
2025-11-14T04:11:27.926Z [Components.js] info: Initiating component loading
2025-11-14T04:11:29.035Z [Components.js] info: Registered 899 components
2025-11-14T04:11:29.036Z [Components.js] info: Loaded configs
2025-11-14T04:11:29.388Z [AccountInitializer] (Primary) info: Creating account for naive.developers@example.com
2025-11-14T04:11:29.649Z [AccountInitializer] (Primary) info: Creating pod at the root
2025-11-14T04:11:29.785Z [GeneratedPodManager] (Primary) info: Creating pod http://localhost:3800/
2025-11-14T04:11:29.832Z [GeneratedPodManager] (Primary) info: Added 12 resources to http://localhost:3800/
2025-11-14T04:11:29.838Z [SeededAccountInitializer] (Primary) info: Creating account for consortium@ac.com
2025-11-14T04:11:29.987Z [SeededAccountInitializer] (Primary) info: Creating pod with name consortium
```

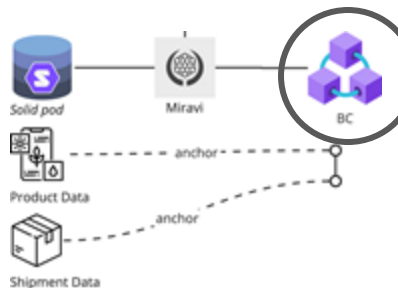
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Demo setup

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2025-11-14T04:11:29.8352 [GeneratedPodManager] (Primary) Info: Added 12 r
resources to http://localhost:3800/
2025-11-14T04:11:29.8382 [SeededAccountInitializer] (Primary) Info: Creat
ing account for consortium/fcc.com
2025-11-14T04:11:30.1872 [SeededAccountInitializer] (Primary) Info: Creat
ing pod with name consortium
2025-11-14T04:11:30.3422 [GeneratedPodManager] (Primary) Info: Creating p
od http://localhost:3800/consortium/
2025-11-14T04:11:30.3942 [GeneratedPodManager] (Primary) Info: Added 13 r
esources to http://localhost:3800/consortium/
2025-11-14T04:11:30.3942 [SeededAccountInitializer] (Primary) Info: Creat
ing account for infofarmer.com
2025-11-14T04:11:30.6752 [SeededAccountInitializer] (Primary) Info: Creat
ing pod with name farmer
2025-11-14T04:11:30.7572 [GeneratedPodManager] (Primary) Info: Creating p
od http://localhost:3800/farmer/
2025-11-14T04:11:30.7982 [GeneratedPodManager] (Primary) Info: Added 13 r
esources to http://localhost:3800/farmer/
2025-11-14T04:11:30.7982 [SeededAccountInitializer] (Primary) Info: Creat
ing account for infopackage.com
2025-11-14T04:11:31.0382 [SeededAccountInitializer] (Primary) Info: Creat
ing pod with name package
2025-11-14T04:11:31.2672 [GeneratedPodManager] (Primary) Info: Creating p
od http://localhost:3800/package/
2025-11-14T04:11:31.3622 [GeneratedPodManager] (Primary) Info: Added 13 r
esources to http://localhost:3800/package/
2025-11-14T04:11:31.3622 [SeededAccountInitializer] (Primary) Info: Creat
ing account for infoagtransporter.com
2025-11-14T04:11:31.5482 [SeededAccountInitializer] (Primary) Info: Creat
ing pod with name transporter
2025-11-14T04:11:31.7562 [GeneratedPodManager] (Primary) Info: Creating p
od http://localhost:3800/transporter/
2025-11-14T04:11:31.7922 [GeneratedPodManager] (Primary) Info: Added 13 r
esources to http://localhost:3800/transporter/
2025-11-14T04:11:31.7922 [SeededAccountInitializer] (Primary) Info: Creat
ing account for infoagwholesaler.com
2025-11-14T04:11:32.0582 [SeededAccountInitializer] (Primary) Info: Creat
ing pod with name wholesaler
2025-11-14T04:11:32.2942 [GeneratedPodManager] (Primary) Info: Creating p
od http://localhost:3800/wholesaler/
2025-11-14T04:11:32.3292 [GeneratedPodManager] (Primary) Info: Added 13 r
esources to http://localhost:3800/wholesaler/
2025-11-14T04:11:32.3292 [SeededAccountInitializer] (Primary) Info: Creat
ing account for infoagretailer.com
2025-11-14T04:11:32.5382 [SeededAccountInitializer] (Primary) Info: Creat
ing pod with name retailer
2025-11-14T04:11:32.7862 [GeneratedPodManager] (Primary) Info: Creating p
od http://localhost:3800/retailer/
2025-11-14T04:11:32.7422 [GeneratedPodManager] (Primary) Info: Added 13 r
esources to http://localhost:3800/retailer/
2025-11-14T04:11:32.7422 [SeededAccountInitializer] (Primary) Info: Creat
ing account for infoagtransporter2.com
2025-11-14T04:11:33.0252 [SeededAccountInitializer] (Primary) Info: Creat
ing pod with name transporter2
2025-11-14T04:11:33.2782 [GeneratedPodManager] (Primary) Info: Creating p
od http://localhost:3800/transporter2/
2025-11-14T04:11:33.3882 [GeneratedPodManager] (Primary) Info: Added 13 r
esources to http://localhost:3800/transporter2/
2025-11-14T04:11:33.3822 [SeededAccountInitializer] (Primary) Info: Initi
alized 7 accounts and 7 pods.
2025-11-14T04:11:33.3822 [ServerInitializer] (Primary) Info: listening to
server at http://localhost:3800/
```

1. Set up Solid Pods
2. **Set up blockchain**
3. Store data as Verifiable Credential on the Solid Pods.
4. Anchor every Verifiable Credential on the blockchain.



```
2025-11-14T04:11:29.835Z [GeneratedPduManager] (Primary) info: Added 12 r
resources to http://localhost:3000/
2025-11-14T04:11:29.836Z [NeedAccountInitializer] (Primary) info: Creat
ing account for consortium@fsc.com
2025-11-14T04:11:30.187Z [NeedAccountInitializer] (Primary) info: Creat
ing pod with name consortium
2025-11-14T04:11:30.262Z [GeneratedPduManager] (Primary) info: Creating p
od http://localhost:3000/consortium/
2025-11-14T04:11:30.364Z [GeneratedPduManager] (Primary) info: Added 13 r
sources to http://localhost:3000/consortium/
2025-11-14T04:11:30.364Z [NeedAccountInitializer] (Primary) info: Creat
ing account for info@farmer.com
2025-11-14T04:11:30.679Z [NeedAccountInitializer] (Primary) info: Creat
ing pod with name farmer
2025-11-14T04:11:30.742Z [GeneratedPduManager] (Primary) info: Creating p
od http://localhost:3000/farmer/
2025-11-14T04:11:30.790Z [GeneratedPduManager] (Primary) info: Added 13 r
sources to http://localhost:3000/farmer/
2025-11-14T04:11:30.790Z [NeedAccountInitializer] (Primary) info: Creat
ing account for info@packager.com
2025-11-14T04:11:31.038Z [NeedAccountInitializer] (Primary) info: Creat
ing pod with name packager
2025-11-14T04:11:31.207Z [GeneratedPduManager] (Primary) info: Creating p
od http://localhost:3000/packager/
2025-11-14T04:11:31.262Z [GeneratedPduManager] (Primary) info: Added 13 r
sources to http://localhost:3000/packager/
2025-11-14T04:11:31.262Z [NeedAccountInitializer] (Primary) info: Creat
ing account for info@transporter.com
2025-11-14T04:11:31.583Z [NeedAccountInitializer] (Primary) info: Creat
ing pod with name transporter
2025-11-14T04:11:31.756Z [GeneratedPduManager] (Primary) info: Creating p
od http://localhost:3000/transporter/
2025-11-14T04:11:31.762Z [GeneratedPduManager] (Primary) info: Added 13 r
sources to http://localhost:3000/transporter/
2025-11-14T04:11:31.762Z [NeedAccountInitializer] (Primary) info: Creat
ing account for info@wholesaler.com
2025-11-14T04:11:32.058Z [NeedAccountInitializer] (Primary) info: Creat
ing pod with name wholesaler
2025-11-14T04:11:32.294Z [GeneratedPduManager] (Primary) info: Creating p
od http://localhost:3000/wholesaler/
2025-11-14T04:11:32.329Z [GeneratedPduManager] (Primary) info: Added 13 r
sources to http://localhost:3000/wholesaler/
2025-11-14T04:11:32.329Z [NeedAccountInitializer] (Primary) info: Creat
ing account for info@retailer.com
2025-11-14T04:11:32.536Z [NeedAccountInitializer] (Primary) info: Creat
ing pod with name retailer
2025-11-14T04:11:32.790Z [GeneratedPduManager] (Primary) info: Creating p
od http://localhost:3000/retailer/
2025-11-14T04:11:32.742Z [GeneratedPduManager] (Primary) info: Added 13 r
sources to http://localhost:3000/retailer/
2025-11-14T04:11:32.742Z [NeedAccountInitializer] (Primary) info: Creat
ing account for info@transporter2.com
2025-11-14T04:11:31.825Z [NeedAccountInitializer] (Primary) info: Creat
ing pod with name transporter2
2025-11-14T04:11:33.270Z [GeneratedPduManager] (Primary) info: Creating p
od http://localhost:3000/transporter2/
2025-11-14T04:11:33.262Z [GeneratedPduManager] (Primary) info: Added 13 r
sources to http://localhost:3000/transporter2/
2025-11-14T04:11:33.303Z [NeedAccountInitializer] (Primary) info: Initia
lized 7 accounts and 7 pods.
2025-11-14T04:11:33.303Z [ServerInitializer] (Primary) info: Listening to
server at http://localhost:3000/
```

-
- The diagram illustrates a blockchain-based supply chain traceability architecture. It features three main components: a Solid pod (represented by a blue cylinder with a white 'S'), Miravi (represented by a grey square with a white 'M'), and a Blockchain (BC) (represented by a circle containing three purple cubes). The Solid pod is connected to Miravi, which is connected to the BC. Below the BC, there are two data sources: Product Data (represented by a document icon) and Shipment Data (represented by a box icon). Both Product Data and Shipment Data are connected to the BC via dashed lines labeled 'anchor'.

```

1 2025-11-14T04:11:29.8352 [GeneratedPodManager] (Primary) info: Added 12 r
2 resources to http://localhost:3000/
3 2025-11-14T04:11:29.8382 [SeedAccountInitializer] (Primary) info: Creat
4 ing account for consortiumfarmr.com
5 2025-11-14T04:11:30.1872 [SeedAccountInitializer] (Primary) info: Creat
6 ing pod with name consortium
7 2025-11-14T04:11:30.3422 [GeneratedPodManager] (Primary) info: Creating p
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9 2025-11-14T04:11:30.3842 [GeneratedPodManager] (Primary) info: Added 13 r
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11 2025-11-14T04:11:30.3842 [SeedAccountInitializer] (Primary) info: Creat
12 ing account for s4farmr.com
13 2025-11-14T04:11:30.6752 [SeedAccountInitializer] (Primary) info: Creat
14 ing pod with name farmer
15 2025-11-14T04:11:30.7332 [GeneratedPodManager] (Primary) info: Creating p
16 od http://localhost:3000/farmer/
17 2025-11-14T04:11:30.7902 [GeneratedPodManager] (Primary) info: Added 13 r
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19 2025-11-14T04:11:30.7902 [SeedAccountInitializer] (Primary) info: Creat
20 ing account for s4farmmanager.com
21 2025-11-14T04:11:31.0302 [SeedAccountInitializer] (Primary) info: Creat
22 ing pod with name packager
23 2025-11-14T04:11:31.2072 [GeneratedPodManager] (Primary) info: Creating p
24 od http://localhost:3000/packager/
25 2025-11-14T04:11:31.3802 [GeneratedPodManager] (Primary) info: Added 13 r
26 esources to http://localhost:3000/packager/
27 2025-11-14T04:11:31.3802 [SeedAccountInitializer] (Primary) info: Creat
28 ing account for s4podtransporter.com
29 2025-11-14T04:11:31.5832 [SeedAccountInitializer] (Primary) info: Creat
30 ing pod with name transporter
31 2025-11-14T04:11:31.7042 [GeneratedPodManager] (Primary) info: Creating p
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33 2025-11-14T04:11:31.7902 [GeneratedPodManager] (Primary) info: Added 13 r
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35 2025-11-14T04:11:31.7902 [SeedAccountInitializer] (Primary) info: Creat
36 ing account for s4podwholesaler.com
37 2025-11-14T04:11:32.0502 [SeedAccountInitializer] (Primary) info: Creat
38 ing pod with name wholesaler
39 2025-11-14T04:11:32.3262 [GeneratedPodManager] (Primary) info: Creating p
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43 2025-11-14T04:11:32.3292 [SeedAccountInitializer] (Primary) info: Creat
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45 2025-11-14T04:11:32.5302 [SeedAccountInitializer] (Primary) info: Creat
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55 2025-11-14T04:11:33.2782 [GeneratedPodManager] (Primary) info: Creating p
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59 2025-11-14T04:11:33.3812 [SeedAccountInitializer] (Primary) info: Initia
60 lized 7 accounts and 7 pods.
61 2025-11-14T04:11:33.3822 [ServerInitializer] (Primary) info: Listening to
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od http://localhost:3000/
2025-11-14T04:11:29.8352 [GeneratedPodManager] (Primary) info: Added 12 r
2025-11-14T04:11:29.8362 [SeededAccountInitializer] (Primary) info: Creat
ing account for consortiumfpc.com
2025-11-14T04:11:30.1872 [SeededAccountInitializer] (Primary) info: Creat
ing pod with name consortium
2025-11-14T04:11:30.3422 [GeneratedPodManager] (Primary) info: Creating a
pod http://localhost:3000/consortium/
2025-11-14T04:11:30.3842 [GeneratedPodManager] (Primary) info: Added 13 r
esources to http://localhost:3000/consortium/
2025-11-14T04:11:30.3842 [SeededAccountInitializer] (Primary) info: Creat
ing account for s4fnetfarmer.com
2025-11-14T04:11:30.6752 [SeededAccountInitializer] (Primary) info: Creat
ing pod with name farmer
2025-11-14T04:11:30.7372 [GeneratedPodManager] (Primary) info: Creating a
pod http://localhost:3000/farmer/
2025-11-14T04:11:30.7902 [GeneratedPodManager] (Primary) info: Added 13 r
esources to http://localhost:3000/farmer/
2025-11-14T04:11:30.7902 [SeededAccountInitializer] (Primary) info: Creat
ing account for s4fnetfarmer.com
2025-11-14T04:11:31.9302 [SeededAccountInitializer] (Primary) info: Creat
ing pod with name package
2025-11-14T04:11:31.2072 [GeneratedPodManager] (Primary) info: Creating a
pod http://localhost:3000/package/
2025-11-14T04:11:31.3822 [GeneratedPodManager] (Primary) info: Added 13 r
esources to http://localhost:3000/package/
2025-11-14T04:11:31.3822 [SeededAccountInitializer] (Primary) info: Creat
ing account for s4fnettransporter.com
2025-11-14T04:11:31.5832 [SeededAccountInitializer] (Primary) info: Creat
ing pod with name transporter
2025-11-14T04:11:31.7042 [GeneratedPodManager] (Primary) info: Creating a
pod http://localhost:3000/transporter/
2025-11-14T04:11:31.7602 [GeneratedPodManager] (Primary) info: Added 13 r
esources to http://localhost:3000/transporter/
2025-11-14T04:11:31.7602 [SeededAccountInitializer] (Primary) info: Creat
ing account for s4fnetwholesaler.com
2025-11-14T04:11:32.0502 [SeededAccountInitializer] (Primary) info: Creat
ing pod with name wholesaler
2025-11-14T04:11:32.3242 [GeneratedPodManager] (Primary) info: Creating a
pod http://localhost:3000/wholesaler/
2025-11-14T04:11:32.3292 [GeneratedPodManager] (Primary) info: Added 13 r
esources to http://localhost:3000/wholesaler/
2025-11-14T04:11:32.3292 [SeededAccountInitializer] (Primary) info: Creat
ing account for s4fnetretailer.com
2025-11-14T04:11:32.5302 [SeededAccountInitializer] (Primary) info: Creat
ing pod with name retailer
2025-11-14T04:11:32.7802 [GeneratedPodManager] (Primary) info: Creating a
pod http://localhost:3000/retailer/
2025-11-14T04:11:32.7422 [GeneratedPodManager] (Primary) info: Added 13 r
esources to http://localhost:3000/retailer/
2025-11-14T04:11:32.7422 [SeededAccountInitializer] (Primary) info: Creat
ing account for s4fnettransporter2.com
2025-11-14T04:11:33.0252 [SeededAccountInitializer] (Primary) info: Creat
ing pod with name transporter2
2025-11-14T04:11:33.2782 [GeneratedPodManager] (Primary) info: Creating a
pod http://localhost:3000/transporter2/
2025-11-14T04:11:33.3802 [GeneratedPodManager] (Primary) info: Added 13 r
esources to http://localhost:3000/transporter2/
2025-11-14T04:11:33.3812 [SeededAccountInitializer] (Primary) info: Initia
lized 7 accounts and 7 pods.
2025-11-14T04:11:33.3822 [ServerInitializer] (Primary) info: Listening to
server at http://localhost:3000/
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```

-
- The diagram illustrates a blockchain-based supply chain traceability architecture. It features a 'Solid pod' (represented by a blue cylinder with a white 'S') connected to a 'Miravi' node (represented by a grey square with a white 'M'). The 'Miravi' node is connected to a 'Blockchain (BC)' (represented by a circle containing three purple cubes). Below the 'Solid pod', there is a 'Product Data' icon (a smartphone) and a 'Shipment Data' icon (a cardboard box). Dashed lines labeled 'anchor' connect the 'Product Data' and 'Shipment Data' icons to the 'Blockchain (BC)'.

Demo setup

```

2025-11-14T04:11:29.8352 [GeneratedPodManager] (Primary) Info: Added 12 r
resources to http://localhost:3800/
2025-11-14T04:11:29.8382 [SeededAccountInitializer] (Primary) Info: Creat
ing account for consortium/fcc.com
2025-11-14T04:11:30.1872 [SeededAccountInitializer] (Primary) Info: Creat
ing pod with name consortium
2025-11-14T04:11:30.3422 [GeneratedPodManager] (Primary) Info: Creating p
od http://localhost:3800/consortium/
2025-11-14T04:11:30.3942 [GeneratedPodManager] (Primary) Info: Added 13 r
sources to http://localhost:3800/consortium/
2025-11-14T04:11:30.3942 [SeededAccountInitializer] (Primary) Info: Creat
ing account for info/farmer.com
2025-11-14T04:11:30.6752 [SeededAccountInitializer] (Primary) Info: Creat
ing pod with name farmer
2025-11-14T04:11:30.7372 [GeneratedPodManager] (Primary) Info: Creating p
od http://localhost:3800/farmer/
2025-11-14T04:11:30.7982 [GeneratedPodManager] (Primary) Info: Added 13 r
sources to http://localhost:3800/farmer/
2025-11-14T04:11:30.7982 [SeededAccountInitializer] (Primary) Info: Creat
ing account for info/packager.com
2025-11-14T04:11:31.0702 [SeededAccountInitializer] (Primary) Info: Creat
ing pod with name packager
2025-11-14T04:11:31.2672 [GeneratedPodManager] (Primary) Info: Creating p
od http://localhost:3800/packager/
2025-11-14T04:11:31.3022 [GeneratedPodManager] (Primary) Info: Added 13 r
sources to http://localhost:3800/packager/
2025-11-14T04:11:31.3022 [SeededAccountInitializer] (Primary) Info: Creat
ing account for info/transporter.com
2025-11-14T04:11:31.5432 [SeededAccountInitializer] (Primary) Info: Creat
ing pod with name transporter
2025-11-14T04:11:31.7562 [GeneratedPodManager] (Primary) Info: Creating p
od http://localhost:3800/transporter/
2025-11-14T04:11:31.7922 [GeneratedPodManager] (Primary) Info: Added 13 r
sources to http://localhost:3800/transporter/
2025-11-14T04:11:31.7922 [SeededAccountInitializer] (Primary) Info: Creat
ing account for info/wholesaler.com
2025-11-14T04:11:32.0502 [SeededAccountInitializer] (Primary) Info: Creat
ing pod with name wholesaler
2025-11-14T04:11:32.2942 [GeneratedPodManager] (Primary) Info: Creating p
od http://localhost:3800/wholesaler/
2025-11-14T04:11:32.3292 [GeneratedPodManager] (Primary) Info: Added 13 r
sources to http://localhost:3800/wholesaler/
2025-11-14T04:11:32.3292 [SeededAccountInitializer] (Primary) Info: Creat
ing account for info/retailer.com
2025-11-14T04:11:32.5382 [SeededAccountInitializer] (Primary) Info: Creat
ing pod with name retailer
2025-11-14T04:11:32.7982 [GeneratedPodManager] (Primary) Info: Creating p
od http://localhost:3800/retailer/
2025-11-14T04:11:32.7422 [GeneratedPodManager] (Primary) Info: Added 13 r
sources to http://localhost:3800/retailer/
2025-11-14T04:11:32.7422 [SeededAccountInitializer] (Primary) Info: Creat
ing account for info/transporter2.com
2025-11-14T04:11:33.0252 [SeededAccountInitializer] (Primary) Info: Creat
ing pod with name transporter2
2025-11-14T04:11:33.2782 [GeneratedPodManager] (Primary) Info: Creating p
od http://localhost:3800/transporter2/
2025-11-14T04:11:33.3082 [GeneratedPodManager] (Primary) Info: Added 13 r
sources to http://localhost:3800/transporter2/
2025-11-14T04:11:33.3022 [SeededAccountInitializer] (Primary) Info: Initi
alized 7 accounts and 7 pods.
2025-11-14T04:11:33.3022 [ServerInitializer] (Primary) Info: listening to
server at http://localhost:3800/

```

```

Block #21
90c8b915f08e921

eth_getTransactionByHash
eth_getTransactionReceipt
eth_blockNumber
eth_chainId
eth_accounts
hardhat_metadata (28)
eth_blockNumber
eth_getBlockByNumber
eth_getBlockByHash
eth_sendTransaction

Contract call:
Transaction:
Contract call:
From: 0x73b08e5a0d88f5faceda882779b177b9220a
To: 0x7b0d2315678afecb367f8320937f642f84188aa3
Value: 0 ETH
Gas used: 8222 of 3000000
Block #21:
0e56e56a80e6a

eth_getTransactionByHash
eth_getTransactionReceipt
eth_blockNumber
eth_chainId

```

```

> npm run redeploy

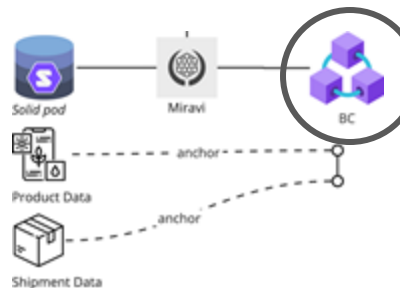
> secweb-aid-vc-anchoring-demo06.2.0 redeploy
> hardhat run scripts/deploy.ts --network localhost & echo "wrote cach
e/contract.json"
> npm run register

> secweb-aid-vc-anchoring-demo06.2.0 register
> hardhat run scripts/register016.ts --network localhost

Registered DID: did:secweb:aid:06:hash: 8aea9c38c78272c30409827645
95d99a3643434571c148d330e94014408
Tx: 0x75e5674d6b2c163099093d747f7375d6c7943775d7331878d52cc99608f

```

1. Set up Solid Pods
2. Set up blockchain
3. Store data as Verifiable Credential on the Solid Pods.
4. Anchor every Verifiable Credential on the blockchain.



```

2025-11-14T04:11:29.835Z [GeneratedPodManager] (Primary) Info: Added 12 r
resources to http://localhost:3000/
2025-11-14T04:11:29.836Z [SeededAccountInitializer] (Primary) Info: Creat
ing account for consortiumsvc.com
2025-11-14T04:11:30.107Z [SeededAccountInitializer] (Primary) Info: Creat
ing pod with name consortium
2025-11-14T04:11:30.342Z [GeneratedPodManager] (Primary) Info: Creating p
od http://localhost:3000/consortium/
2025-11-14T04:11:30.364Z [GeneratedPodManager] (Primary) Info: Added 13 r
sources to http://localhost:3000/consortium/
2025-11-14T04:11:30.364Z [SeededAccountInitializer] (Primary) Info: Creat
ing account for istiofederator.com
2025-11-14T04:11:30.679Z [SeededAccountInitializer] (Primary) Info: Creat
ing pod with name farmer
2025-11-14T04:11:30.732Z [GeneratedPodManager] (Primary) Info: Creating p
od http://localhost:3000/farmer/
2025-11-14T04:11:30.790Z [GeneratedPodManager] (Primary) Info: Added 13 r
sources to http://localhost:3000/farmer/
2025-11-14T04:11:30.790Z [SeededAccountInitializer] (Primary) Info: Creat
ing account for infopackage.com
2025-11-14T04:11:31.030Z [SeededAccountInitializer] (Primary) Info: Creat
ing pod with name package
2025-11-14T04:11:31.287Z [GeneratedPodManager] (Primary) Info: Creating p
od http://localhost:3000/package/
2025-11-14T04:11:31.302Z [GeneratedPodManager] (Primary) Info: Added 13 r
sources to http://localhost:3000/package/
2025-11-14T04:11:31.302Z [SeededAccountInitializer] (Primary) Info: Creat
ing account for infoimporter.com
2025-11-14T04:11:31.583Z [SeededAccountInitializer] (Primary) Info: Creat
ing pod with name transporter
2025-11-14T04:11:31.765Z [GeneratedPodManager] (Primary) Info: Creating p
od http://localhost:3000/transporter/
2025-11-14T04:11:31.792Z [GeneratedPodManager] (Primary) Info: Added 13 r
sources to http://localhost:3000/transporter/
2025-11-14T04:11:31.792Z [SeededAccountInitializer] (Primary) Info: Creat
ing account for infowholesaler.com
2025-11-14T04:11:32.058Z [SeededAccountInitializer] (Primary) Info: Creat
ing pod with name wholesaler
2025-11-14T04:11:32.204Z [GeneratedPodManager] (Primary) Info: Creating p
od http://localhost:3000/wholesaler/
2025-11-14T04:11:32.329Z [GeneratedPodManager] (Primary) Info: Added 13 r
sources to http://localhost:3000/wholesaler/
2025-11-14T04:11:32.329Z [SeededAccountInitializer] (Primary) Info: Creat
ing account for infogetretailer.com
2025-11-14T04:11:32.536Z [SeededAccountInitializer] (Primary) Info: Creat
ing pod with name retailer
2025-11-14T04:11:32.796Z [GeneratedPodManager] (Primary) Info: Creating p
od http://localhost:3000/retailer/
2025-11-14T04:11:32.742Z [GeneratedPodManager] (Primary) Info: Added 13 r
sources to http://localhost:3000/retailer/
2025-11-14T04:11:32.742Z [SeededAccountInitializer] (Primary) Info: Creat
ing account for infogettransporter2.com
2025-11-14T04:11:33.025Z [SeededAccountInitializer] (Primary) Info: Creat
ing pod with name transporter2
2025-11-14T04:11:33.279Z [GeneratedPodManager] (Primary) Info: Creating p
od http://localhost:3000/transporter2/
2025-11-14T04:11:33.360Z [GeneratedPodManager] (Primary) Info: Added 13 r
sources to http://localhost:3000/transporter2/
2025-11-14T04:11:33.360Z [SeededAccountInitializer] (Primary) Info: Initia
lized 7 accounts and 7 pods.
2025-11-14T04:11:33.362Z [ServerInitializer] (Primary) Info: Listening to
server at http://localhost:3000/

```

-
- The diagram illustrates a blockchain-based supply chain traceability architecture. It features three main components in a horizontal flow: a 'Solid pool' (represented by a blue cylinder with a white 'S'), 'Miravi' (represented by a grey square with a circular logo), and a 'BC' (Blockchain, represented by a purple cube with a circular logo). Solid lines connect these three components. Below the 'Solid pool' and 'Miravi' are two data sources: 'Product Data' (represented by a document icon) and 'Shipment Data' (represented by a box icon). Dashed lines labeled 'anchor' connect 'Product Data' and 'Shipment Data' to the 'BC' component, indicating their integration into the blockchain.

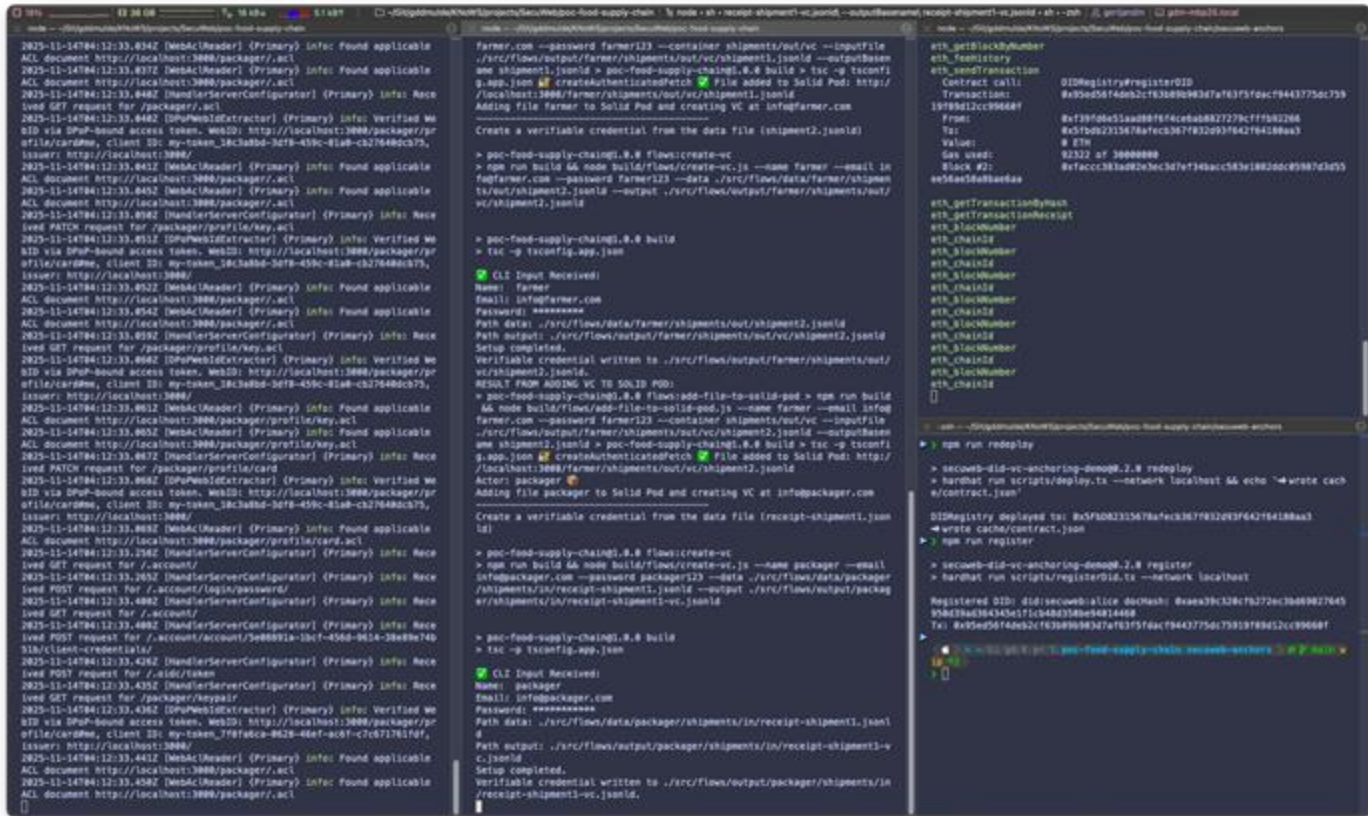
```

2025-11-14T04:11:29.8352 [GeneratedPodManager] (Primary) Info: Added 12 r
resources to http://localhost:3000/
2025-11-14T04:11:29.8362 [SeedAccountInitializer] (Primary) Info: Creat
ing account for consortiumsvc.com
2025-11-14T04:11:30.1872 [SeedAccountInitializer] (Primary) Info: Creat
ing pod with name consortium
2025-11-14T04:11:30.3422 [GeneratedPodManager] (Primary) Info: Creating p
od http://localhost:3000/consortium/
2025-11-14T04:11:30.3842 [GeneratedPodManager] (Primary) Info: Added 13 r
sources to http://localhost:3000/consortium/
2025-11-14T04:11:30.3842 [SeedAccountInitializer] (Primary) Info: Creat
ing account for istiofederator.com
2025-11-14T04:11:30.6792 [SeedAccountInitializer] (Primary) Info: Creat
ing pod with name farmer
2025-11-14T04:11:30.7432 [GeneratedPodManager] (Primary) Info: Creating p
od http://localhost:3000/farmer/
2025-11-14T04:11:30.7902 [GeneratedPodManager] (Primary) Info: Added 13 r
sources to http://localhost:3000/farmer/
2025-11-14T04:11:30.7902 [SeedAccountInitializer] (Primary) Info: Creat
ing account for infopackage.com
2025-11-14T04:11:31.0302 [SeedAccountInitializer] (Primary) Info: Creat
ing pod with name package
2025-11-14T04:11:31.2872 [GeneratedPodManager] (Primary) Info: Creating p
od http://localhost:3000/package/
2025-11-14T04:11:31.3622 [GeneratedPodManager] (Primary) Info: Added 13 r
sources to http://localhost:3000/package/
2025-11-14T04:11:31.3622 [SeedAccountInitializer] (Primary) Info: Creat
ing account for infoimporter.com
2025-11-14T04:11:31.5632 [SeedAccountInitializer] (Primary) Info: Creat
ing pod with name transporter
2025-11-14T04:11:31.7652 [GeneratedPodManager] (Primary) Info: Creating p
od http://localhost:3000/transporter/
2025-11-14T04:11:31.7622 [GeneratedPodManager] (Primary) Info: Added 13 r
sources to http://localhost:3000/transporter/
2025-11-14T04:11:31.7622 [SeedAccountInitializer] (Primary) Info: Creat
ing account for infowholesaler.com
2025-11-14T04:11:32.0582 [SeedAccountInitializer] (Primary) Info: Creat
ing pod with name wholesaler
2025-11-14T04:11:32.2042 [GeneratedPodManager] (Primary) Info: Creating p
od http://localhost:3000/wholesaler/
2025-11-14T04:11:32.3292 [GeneratedPodManager] (Primary) Info: Added 13 r
sources to http://localhost:3000/wholesaler/
2025-11-14T04:11:32.3292 [SeedAccountInitializer] (Primary) Info: Creat
ing account for infogetretailer.com
2025-11-14T04:11:32.5382 [SeedAccountInitializer] (Primary) Info: Creat
ing pod with name retailer
2025-11-14T04:11:32.7902 [GeneratedPodManager] (Primary) Info: Creating p
od http://localhost:3000/retailer/
2025-11-14T04:11:32.7422 [GeneratedPodManager] (Primary) Info: Added 13 r
sources to http://localhost:3000/retailer/
2025-11-14T04:11:32.7422 [SeedAccountInitializer] (Primary) Info: Creat
ing account for infogettransporter2.com
2025-11-14T04:11:33.0252 [SeedAccountInitializer] (Primary) Info: Creat
ing pod with name transporter2
2025-11-14T04:11:33.2782 [GeneratedPodManager] (Primary) Info: Creating p
od http://localhost:3000/transporter2/
2025-11-14T04:11:33.3602 [GeneratedPodManager] (Primary) Info: Added 13 r
sources to http://localhost:3000/transporter2/
2025-11-14T04:11:33.3602 [SeedAccountInitializer] (Primary) Info: Initia
lized 7 accounts and 7 pods.
2025-11-14T04:11:33.3612 [ServerInitializer] (Primary) Info: Listening to
server at http://localhost:3000/

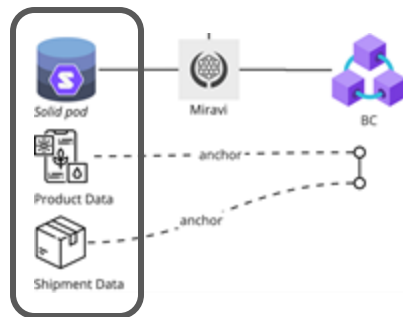
```

-
- The diagram illustrates a blockchain-based supply chain traceability architecture. It features three main components: a 'Solid pool' (represented by a blue cylinder with a dollar sign), 'Miravi' (represented by a grey square with a brain icon), and a 'BC' (Blockchain, represented by a purple cube with a circular arrow). The 'Solid pool' is connected to 'Miravi', which is connected to the 'BC'. Below these, 'Product Data' (represented by a document icon) and 'Shipment Data' (represented by a box icon) are shown. Dashed lines labeled 'anchor' connect both 'Product Data' and 'Shipment Data' to the 'BC'.

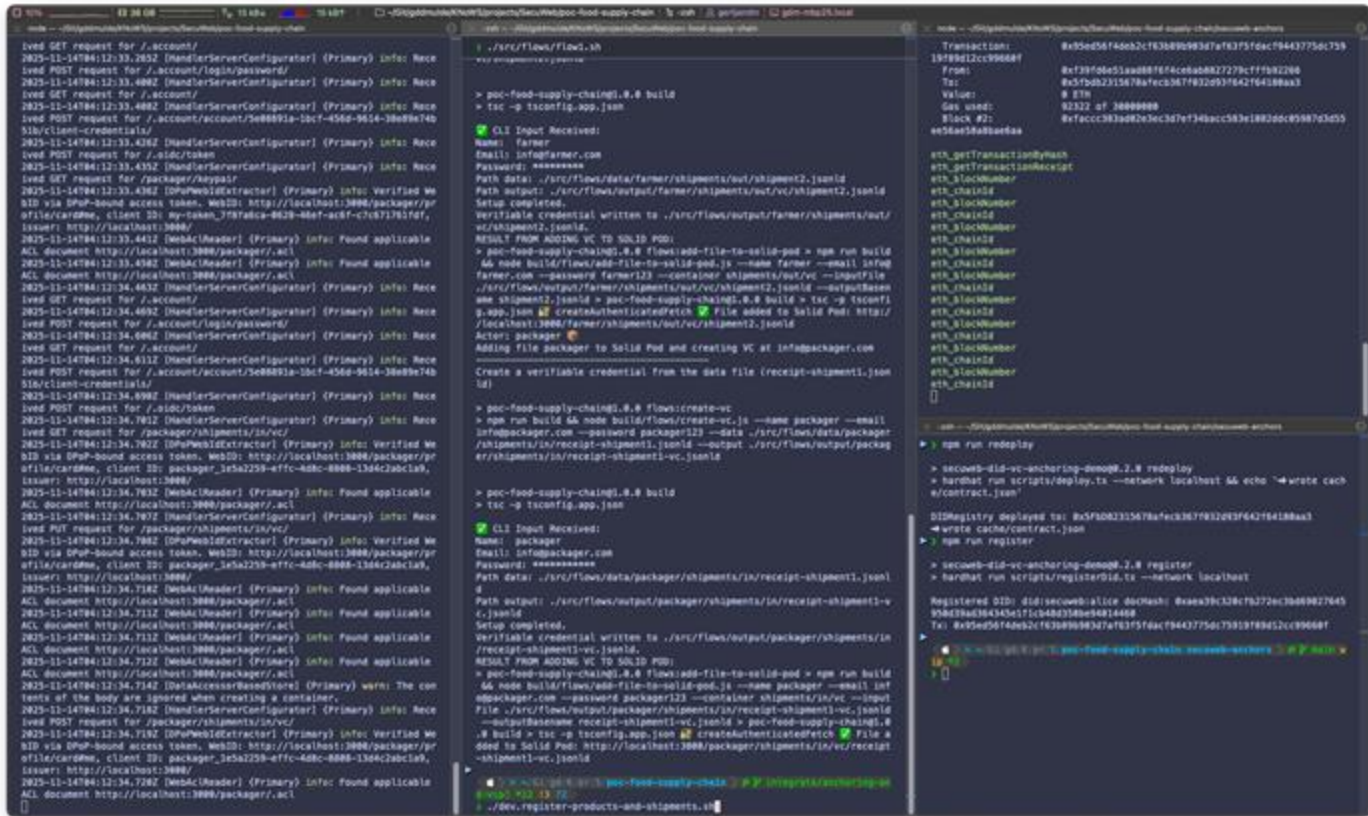
Demo setup



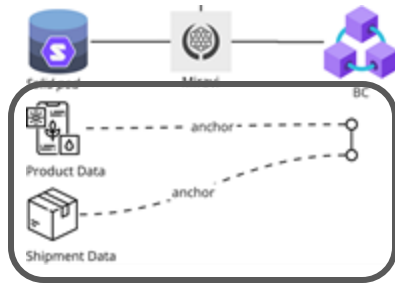
1. Set up Solid Pods
2. Set up blockchain
3. **Store data as Verifiable Credential on the Solid Pods.**
4. Anchor every Verifiable Credential on the blockchain.



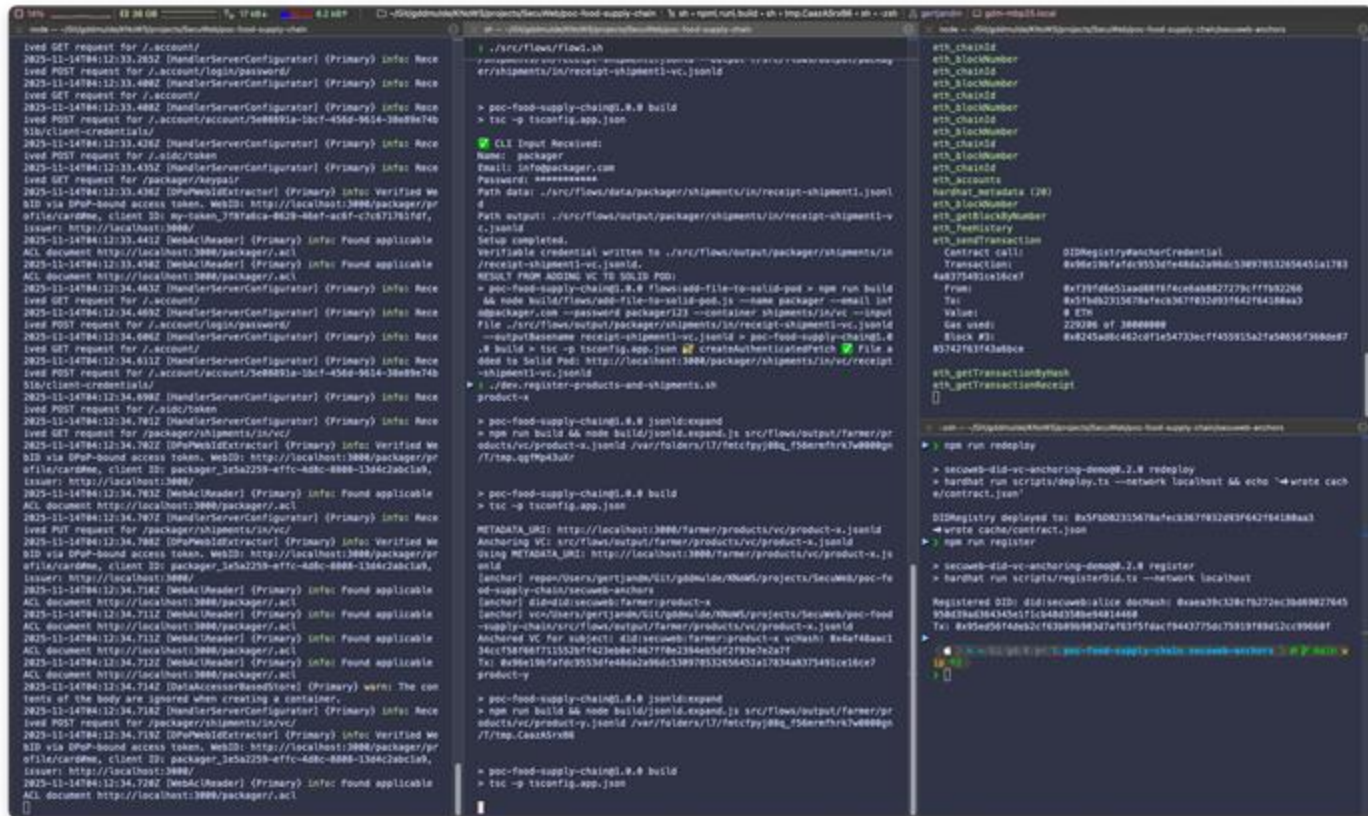
Demo setup



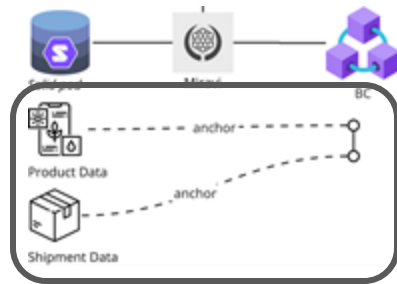
1. Set up Solid Pods
2. Set up blockchain
3. Store data as Verifiable Credential on the Solid Pods.
4. **Anchor every Verifiable Credential on the blockchain.**



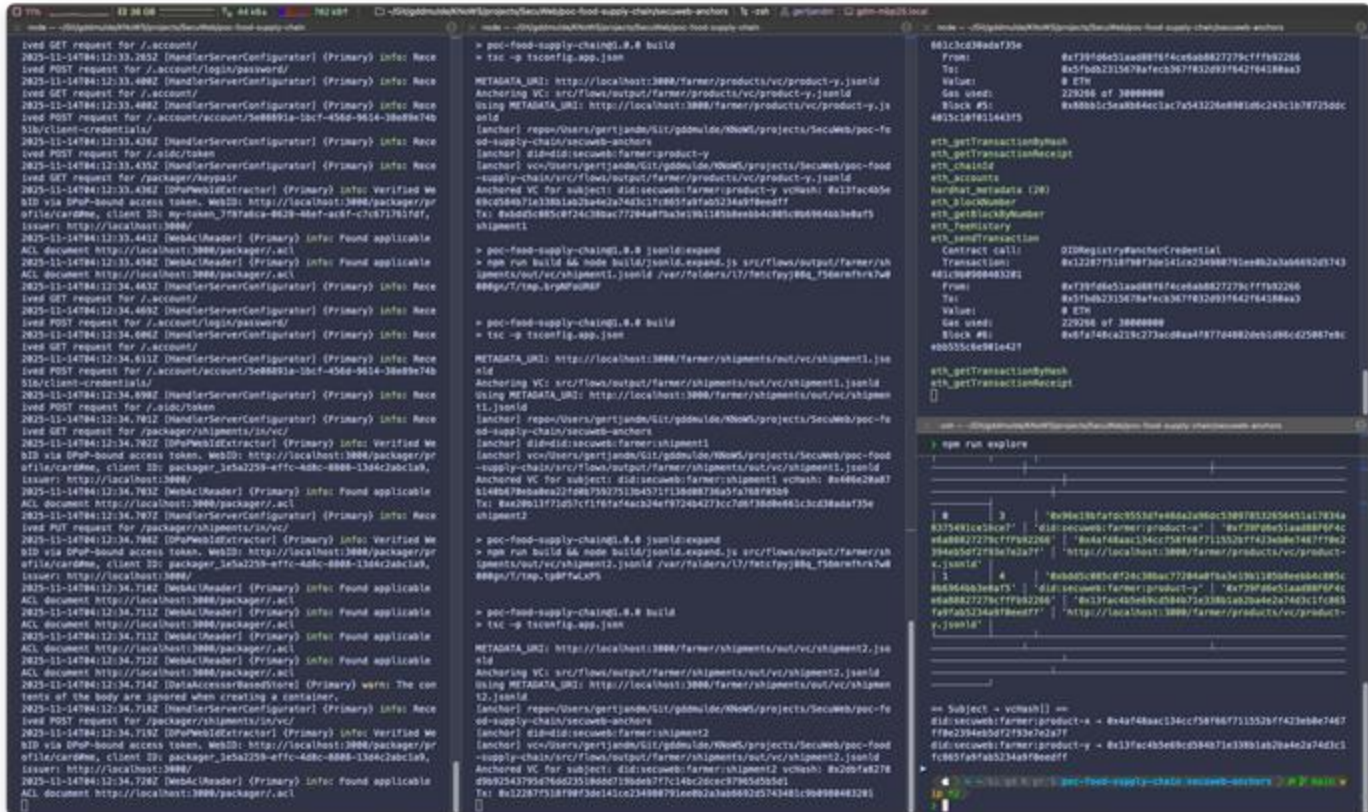
Demo setup



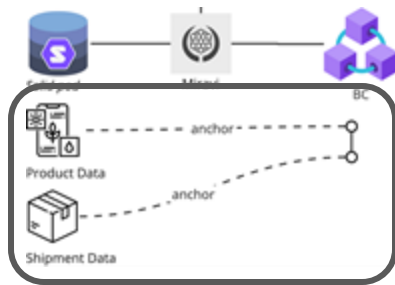
1. Set up Solid Pods
2. Set up blockchain
3. Store data as Verifiable Credential on the Solid Pods.
4. **Anchor every Verifiable Credential on the blockchain.**



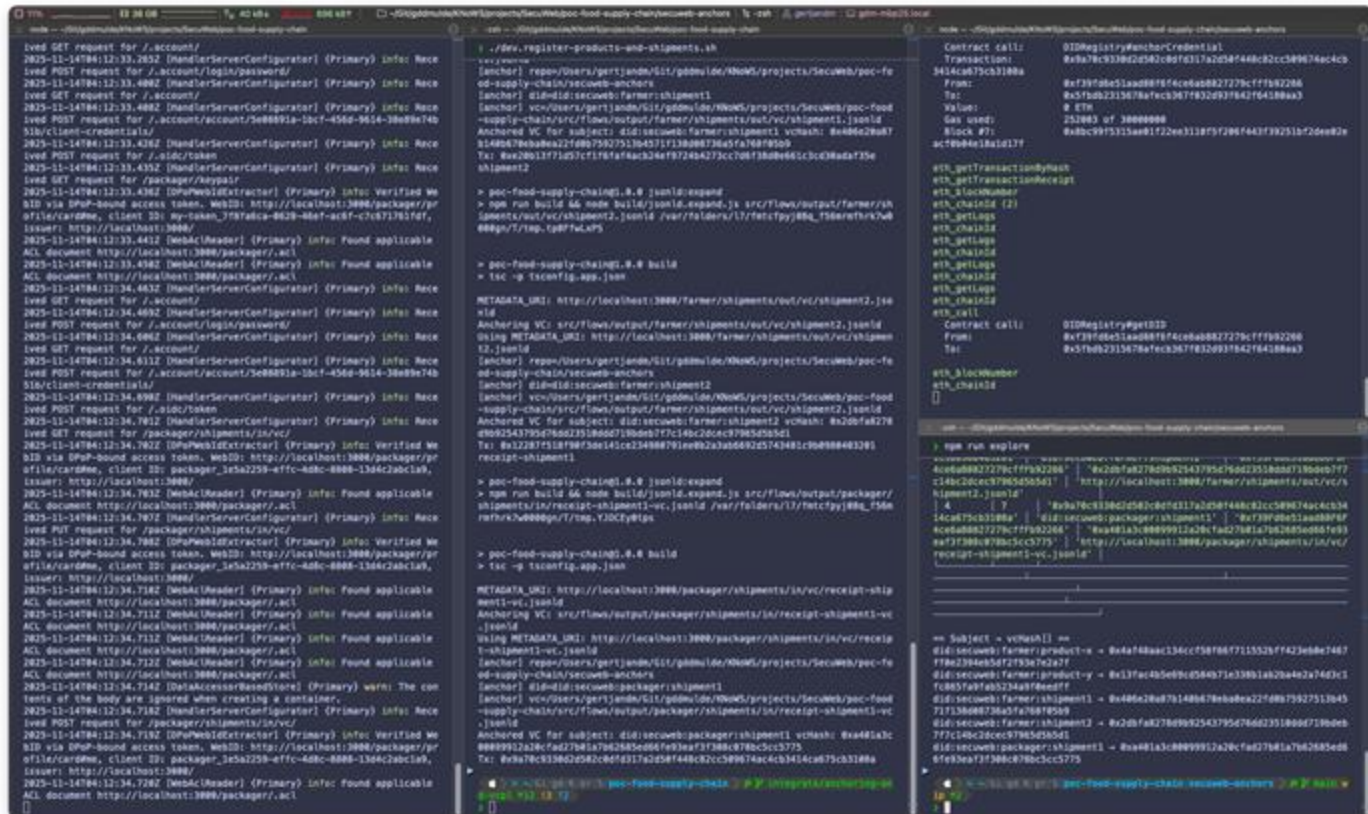
Demo setup



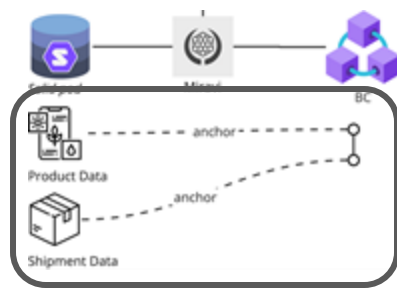
1. Set up Solid Pods
2. Set up blockchain
3. Store data as Verifiable Credential on the Solid Pods.
4. **Anchor every Verifiable Credential on the blockchain.**



Demo setup



1. Set up Solid Pods
2. Set up blockchain
3. Store data as Verifiable Credential on the Solid Pods.
4. **Anchor every Verifiable Credential on the blockchain.**

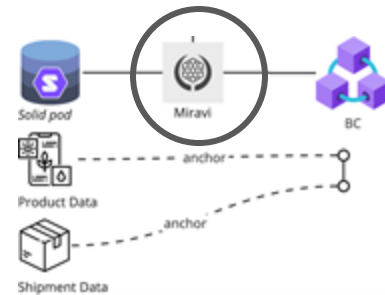


Demo setup: Miravi

```

  1  / ~ / G / p d / K / p / Secuweb  cd poc-food-supply-chain-miravi/main && npm run dev
  2
  3  > miravi-a-linked-data-viewer@1.0.0 dev
  4  > vite
  5
  6  VITE v4.5.13  ready in 115 ms
  7
  8  • Local:   http://localhost:5173/
  9  • Network: use --host to expose
 10  • press h to show help

```



Demo

Use case: Product Shipping

- Farmer has multiple products
- Farmer ships products to Packager, using a Transporter

Features

Secure: Actors control which data to share with whom.

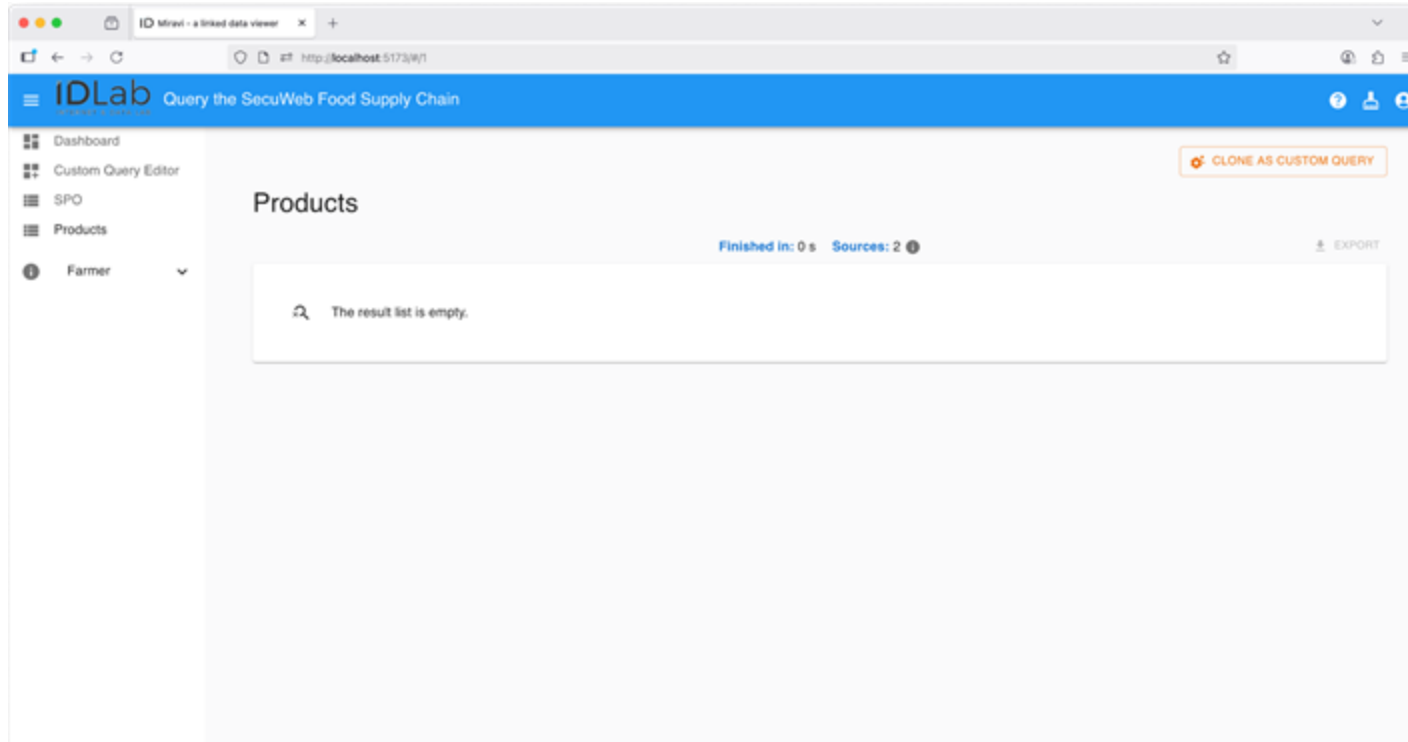
- Only the appropriate actors can access information about products and shipments.

For example

- Transporter can read shipment information, but cannot read product details
- Packager can read both shipment information and product details

Verifiable: Actors can trust the data they are “seeing”

Unauthenticated



Actors control which data to share with whom.

In this example, the Farmer decided that its product data is not publicly readable. Instead, only the actors involved in a business process (e.g., shipping a product) should be able to read the product data.

 Control

Authenticated as **Packager**

View: Products

Authenticated as **Packager**

Query the SecuWeb Food Supply Chain

CLONE AS CUSTOM QUERY

Products

Finished in: 0 s Sources: 2

EXPORT

x	p	o
bc_0_b2_df_2143_6	schema.name	Organic Cherry Tomatoes
bc_0_b2_df_2143_6	schema.description	Sweet, ripe organic cherry tomatoes grown without pesticides, perfect for salads, sauces, and fresh snacking.
bc_0_b2_df_2143_6	schema.productID	product-X
bc_0_b2_df_2143_6	schema.category	Vegetable
bc_0_b2_df_2143_6	schema.brand	bc_0_b2_df_2143_1
bc_0_b2_df_2143_6	schema.weight	bc_0_b2_df_2143_2
bc_0_b2_df_2143_6	schema.offers	bc_0_b2_df_2143_3
bc_0_b2_df_2143_6	http://www.w3.org/1999/02/22-rdf-syntax-ns#type	schema:Product
bc_1_b1_df_2141_6	schema.name	Organic Roma Tomatoes
bc_1_b1_df_2141_6	schema.description	Plump, meaty Roma tomatoes grown organically, perfect for sauces, canning, and slow-roasted dishes.

Rows per page: 10 1-10 of 16 < 1 2 >

Authenticated as **Packager**

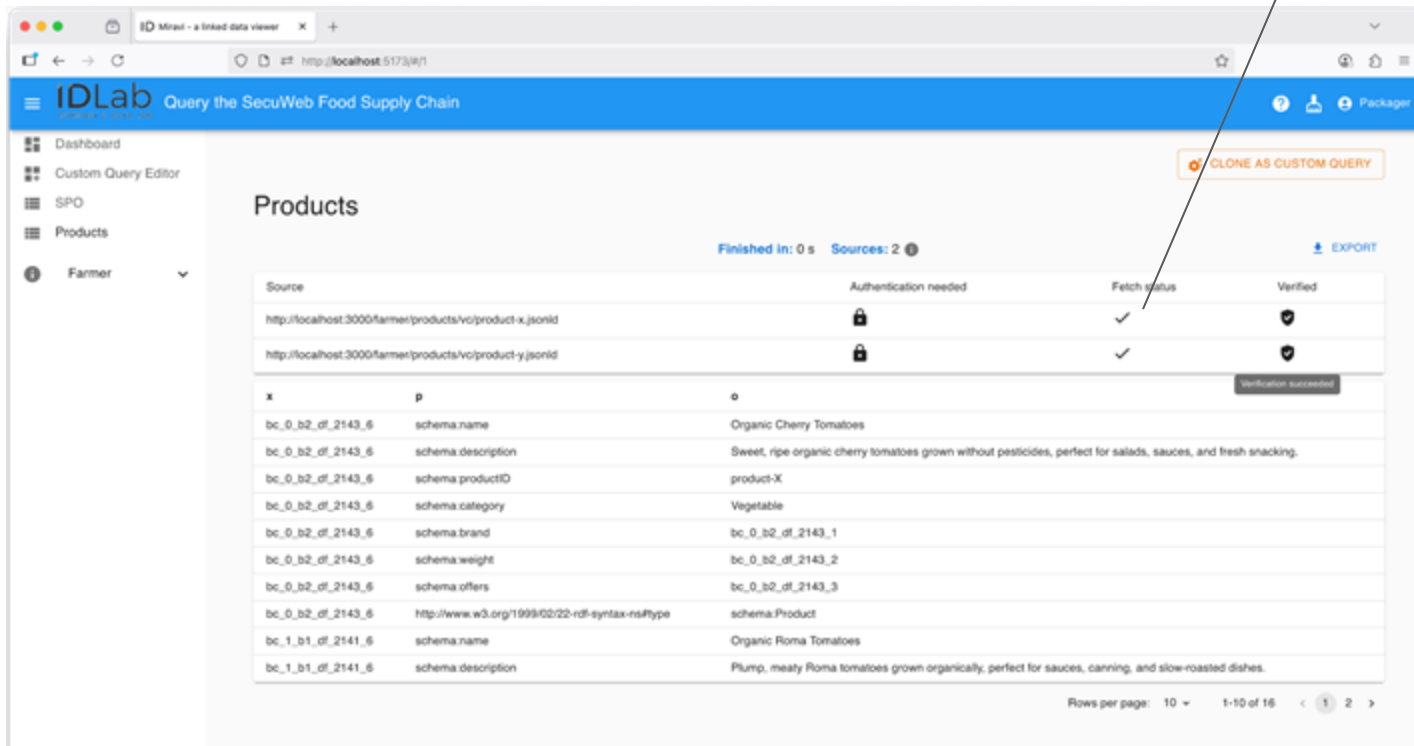
View: Products

Access control

Packager has read access to product details

The Packager receives the Farmer's produces. Therefore, Packager can read the product data.

 Control



Finished in: 0 s Sources: 2

EXPORT

Source	Authentication needed	Fetch status	Verified
http://localhost:3000/farmer/products/vc/product-x.jsonld		✓	
http://localhost:3000/farmer/products/vc/product-y.jsonld		✓	

Verification succeeded

x	p	o
bc_0_b2_df_2143_6	schema.name	Organic Cherry Tomatoes
bc_0_b2_df_2143_6	schema.description	Sweet, ripe organic cherry tomatoes grown without pesticides, perfect for salads, sauces, and fresh snacking.
bc_0_b2_df_2143_6	schema.productID	product-X
bc_0_b2_df_2143_6	schema.category	Vegetable
bc_0_b2_df_2143_6	schema.brand	bc_0_b2_df_2143_1
bc_0_b2_df_2143_6	schema.weight	bc_0_b2_df_2143_2
bc_0_b2_df_2143_6	schema.offers	bc_0_b2_df_2143_3
bc_0_b2_df_2143_6	http://www.w3.org/1999/02/22-rdf-syntax-ns#type	schema.Product
bc_1_b1_df_2141_6	schema.name	Organic Roma Tomatoes
bc_1_b1_df_2141_6	schema.description	Plump, meaty Roma tomatoes grown organically, perfect for sauces, canning, and slow-roasted dishes.

Rows per page: 10 1-10 of 16 < 1 2 >

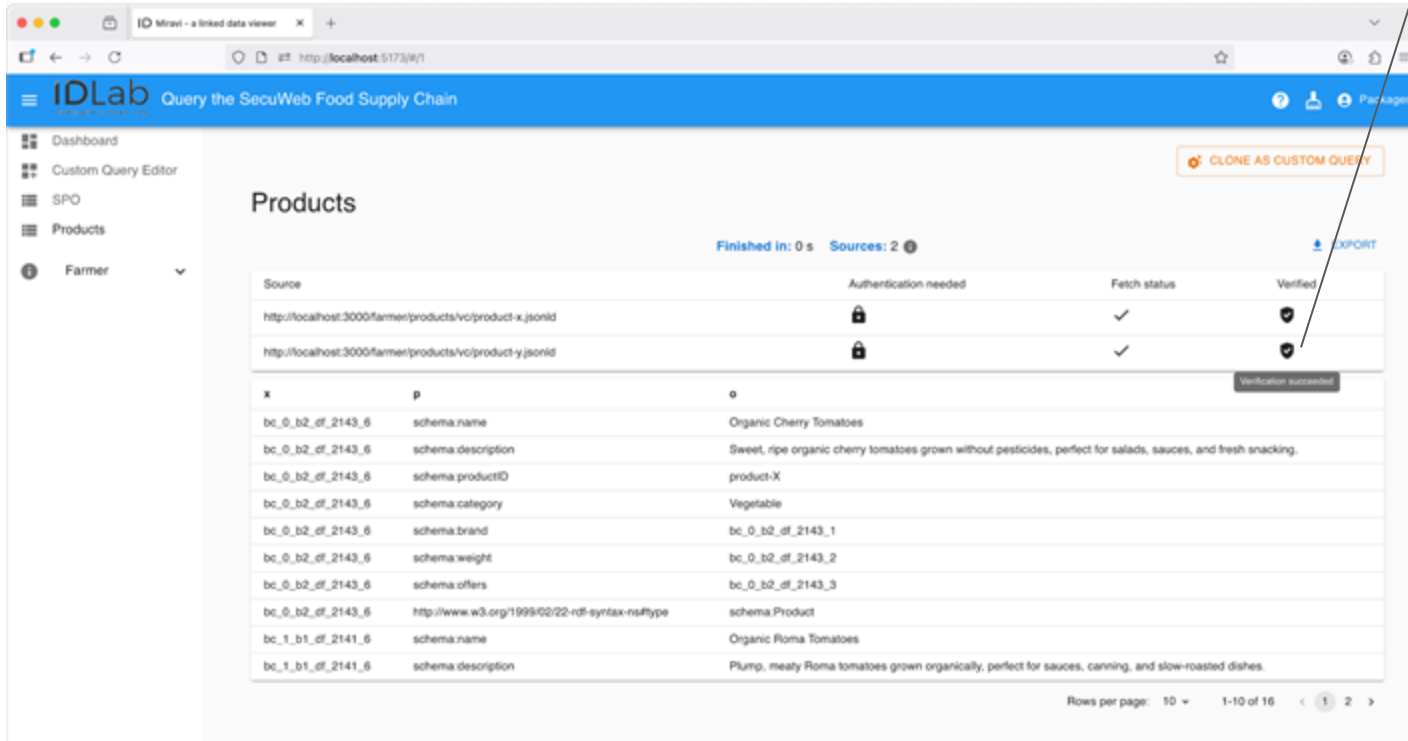
Authenticated as **Packager**

View: Products

Verifiable product data

Actors can verify the authenticity and integrity of the data they have access to.

 Trust



The screenshot shows the IDLab interface for querying the SecuWeb Food Supply Chain. The user is authenticated as 'Packager'. The 'Products' view is active, displaying a table of product data. The table has columns for Source, Authentication needed, Fetch status, and Verified. Two sources are listed, both with a lock icon for authentication and a checkmark for fetch status. A 'Verification succeeded' message is visible at the bottom right of the table. The table content is as follows:

x	p	o
bc_0_b2_of_2143_6	schema.name	Organic Cherry Tomatoes
bc_0_b2_of_2143_6	schema.description	Sweet, ripe organic cherry tomatoes grown without pesticides, perfect for salads, sauces, and fresh snacking.
bc_0_b2_of_2143_6	schema.productID	product-X
bc_0_b2_of_2143_6	schema.category	Vegetable
bc_0_b2_of_2143_6	schema.brand	bc_0_b2_of_2143_1
bc_0_b2_of_2143_6	schema.weight	bc_0_b2_of_2143_2
bc_0_b2_of_2143_6	schema.offers	bc_0_b2_of_2143_3
bc_0_b2_of_2143_6	http://www.w3.org/1999/02/22-rdf-syntax-ns#type	schema.Product
bc_1_b1_of_2141_6	schema.name	Organic Roma Tomatoes
bc_1_b1_of_2141_6	schema.description	Plump, meaty Roma tomatoes grown organically, perfect for sauces, canning, and slow-roasted dishes.

Authenticated as **Transporter**

View: Products

Authenticated as **Transporter**

Access control
Transporter has no read access to
product details

Products

Finished in: 0 s Sources: 2

Source	Authentication needed	Fetch status	Verified
http://localhost:3000/farmer/products/vc/product-x.jsonld	🔒	🔄	?
http://localhost:3000/farmer/products/vc/product-y.jsonld	🔒	🔄	?

The result list is empty.

Authenticated as **Transporter**

View: Shipments

Access control

Transporter has read access to shipments

Query shipments from: Farmer

Finished in: 0 s Sources: 2

EXPORT

Source	Authentication needed	Fetch status	Verified
http://localhost:3000/farmer/shipments/out/vc/shipment1.jsonld	🔒	✓	🛡️
http://localhost:3000/farmer/shipments/out/vc/shipment2.jsonld	🔒	✓	🛡️

x	p	o
bc_0_b2_of_2151_4	http://www.w3.org/1999/02/22-rdf-syntax-ns#type	ex:ShipmentRecord
bc_0_b2_of_2151_4	ex:status	shipped
bc_0_b2_of_2151_4	ex:quantity	10
bc_0_b2_of_2151_4	ex:productID	farmer.products/product-X
bc_0_b2_of_2151_4	ex:origin	farmer.profile/card#me
bc_0_b2_of_2151_4	ex:destination	packager.profile/card#me
bc_0_b2_of_2151_4	ex:transport	transporter.profile/card#me
bc_1_b1_of_2149_4	http://www.w3.org/1999/02/22-rdf-syntax-ns#type	ex:ShipmentRecord
bc_1_b1_of_2149_4	ex:status	shipped
bc_1_b1_of_2149_4	ex:quantity	30

Rows per page: 10 1-10 of 14 1 2 >

Authenticated as **Packager**

View: Products (with on-chain verification)

On-chain verification of
product data

Actors can verify the on-chain hash of the anchored VC.

↑ Data Integrity
↑ Trust

The screenshot shows the IDLab web application interface. The top navigation bar includes the IDLab logo, the text "Query the SecuWeb Food Supply Chain", and a "Sign in" button. A sidebar on the left contains a menu with "Dashboard", "Custom Query Editor", "SPO", "Products", and "Farmer". The main content area is titled "Products" and displays a table of verification results. The table has columns for "Source", "Authentication needed", "Fetch status", "Verified", and "Chain Verified". Two sources are listed, both with a lock icon for authentication and a checkmark for fetch status. The first source is fully verified, while the second has question marks. Below the table is a detailed JSON-LD view of the product data, showing fields like schema.url, schema.name, schema.description, schema.productID, schema.category, schema.brand, schema.weight, schema.offers, and schema.type.

Source	Authentication needed	Fetch status	Verified	Chain Verified
http://localhost:3000/farmer/products/vc/product-x.jsonld	🔒	✓	✓	✓
http://localhost:3000/farmer/products/vc/product-y.jsonld	🔒	✓	?	?

x	p	o
bc_0_b2_of_2065_6	schema.url	http://localhost:3000/farmer/products/vc/product-x.jsonld
bc_0_b2_of_2065_6	schema.name	Organic Cherry Tomatoes
bc_0_b2_of_2065_6	schema.description	Sweet, ripe organic cherry tomatoes grown without pesticides, perfect for salads, sauces, and fresh snacking.
bc_0_b2_of_2065_6	schema.productID	product-X
bc_0_b2_of_2065_6	schema.category	Vegetable
bc_0_b2_of_2065_6	schema.brand	bc_0_b2_of_2065_1
bc_0_b2_of_2065_6	schema.weight	bc_0_b2_of_2065_2
bc_0_b2_of_2065_6	schema.offers	bc_0_b2_of_2065_3
bc_0_b2_of_2065_6	http://www.w3.org/1999/02/22-rdf-syntax-ns#type	schema:Product
bc_1_b1_of_2067_6	schema.url	http://localhost:3000/farmer/products/vc/product-y.jsonld

Authenticated as **Packager**

View: Products (with on-chain verification)

On-chain verification of
product data

The screenshot shows the IDLab web application interface. The top navigation bar includes a menu, the IDLab logo, the text 'Query the SecuWeb Food Supply Chain', and user controls for 'Sign in' and 'Farmer'. The left sidebar contains navigation links for 'Dashboard', 'Custom Query Editor', 'SPO', 'Products', and 'Farmer'. The main content area is titled 'Products' and displays a table of verification results. The table has columns for 'Source', 'Authentication needed', 'Fetch status', 'Verified', and 'Chain Verified'. Two sources are listed, both with a lock icon for authentication and a checkmark for fetch status. The 'Chain Verified' column shows a shield icon for the first source and a tooltip for the second source. The tooltip contains the text: 'Verification succeeded. Chain hash: 5a0fca50a665f4e4d450c3e4e21cc2b030a0b77300580c47257044006663e'. Below the table is a detailed JSON representation of the product data.

Products

Finished in: 0 s Sources: 2

EXPORT

Source	Authentication needed	Fetch status	Verified	Chain Verified
http://localhost:3000/farmer/products/vc/product-x.jsonld	🔒	✓	🛡️	🛡️
http://localhost:3000/farmer/products/vc/product-y.jsonld	🔒	✓	🛡️	🛡️

Verification succeeded. Chain hash: 5a0fca50a665f4e4d450c3e4e21cc2b030a0b77300580c47257044006663e

```
{
  "x": "bc_0_b2_of_2065_6",
  "p": "schema:url",
  "o": "http://localhost:3000/farmer/products/vc/product-x.jsonld"
}, {
  "x": "bc_0_b2_of_2065_6",
  "p": "schema:name",
  "o": "Organic Cherry Tomatoes"
}, {
  "x": "bc_0_b2_of_2065_6",
  "p": "schema:description",
  "o": "Sweet, ripe organic cherry tomatoes grown without pesticides, perfect for salads, sauces, and fresh snacking."
}, {
  "x": "bc_0_b2_of_2065_6",
  "p": "schema:productID",
  "o": "product-X"
}, {
  "x": "bc_0_b2_of_2065_6",
  "p": "schema:category",
  "o": "Vegetable"
}, {
  "x": "bc_0_b2_of_2065_6",
  "p": "schema:brand",
  "o": "bc_0_b2_of_2065_1"
}, {
  "x": "bc_0_b2_of_2065_6",
  "p": "schema:weight",
  "o": "bc_0_b2_of_2065_2"
}, {
  "x": "bc_0_b2_of_2065_6",
  "p": "schema:offers",
  "o": "bc_0_b2_of_2065_3"
}, {
  "x": "bc_0_b2_of_2065_6",
  "p": "http://www.w3.org/1999/02/22-rdf-syntax-ns#type",
  "o": "schema:Product"
}, {
  "x": "bc_1_b1_of_2067_6",
  "p": "schema:url",
  "o": "http://localhost:3000/farmer/products/vc/product-y.jsonld"
}
```

Rows per page: 10 1-10 of 18 < 1 2 >

Actors can verify the on-chain hash of the anchored VC.

- ↑ Data Integrity
- ↑ Trust

Next steps

Continue development to implement the overarching Food Recall use case.

Evaluation

- Performance by benchmarking different on- vs off-chain storage configurations.
- Security (using STRIDE)
- Privacy (using LINDDUN)

STRIDE: https://owasp.org/www-community/Threat_Modeling_Process

LINDDUN: <https://linddun.org/>

Questions?