

## Goal/Agenda today

- Join the network with a node
- Run all demo's
- Register organizations
- Interact with the node APIs



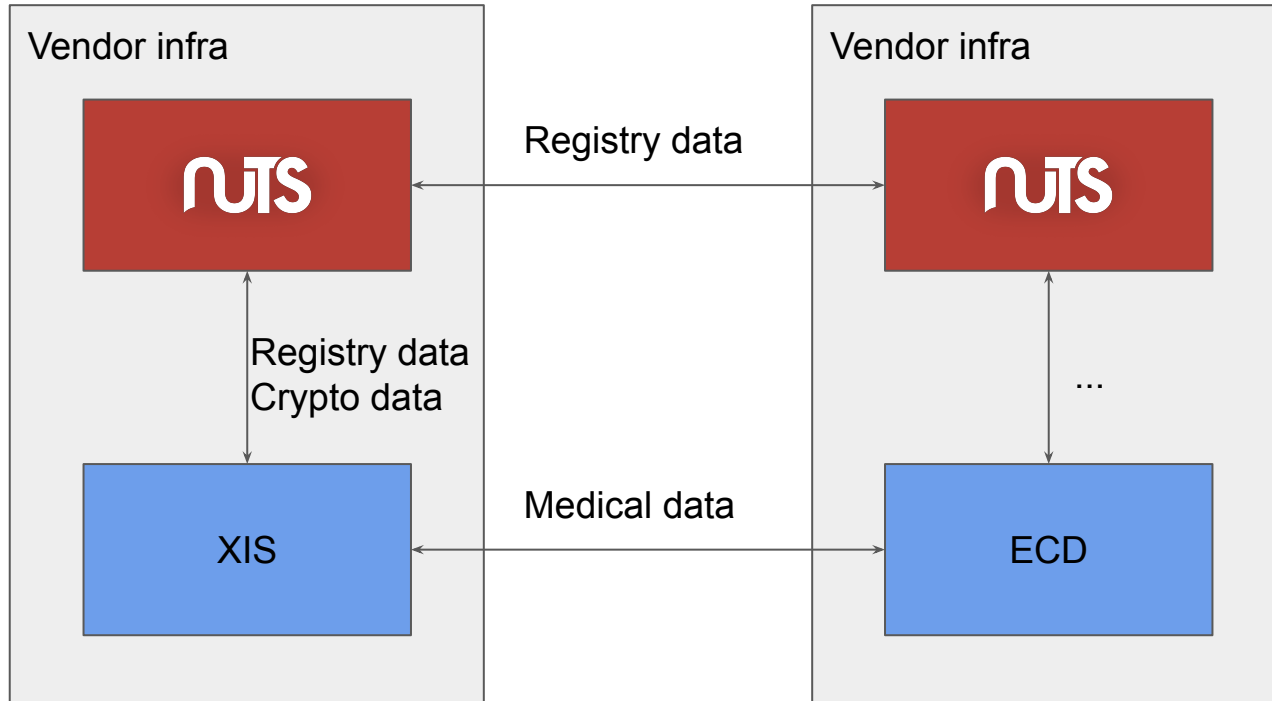
<https://github.com/nuts-foundation/nuts-workshops>

<https://nuts-node.readthedocs.io/en/latest/>

<https://nuts-foundation.gitbook.io/drafts/>

<https://nuts-foundation.gitbook.io/bolts/eoverdracht/leveranciersspecificatie>

# Architecture



## Run a local node

```
git clone https://github.com/nuts-foundation/nuts-network-local  
cd nuts-network-local/single  
docker-compose pull  
docker-compose up
```

## Check status

```
docker ps
```

```
docker logs single_node_1
```

```
GET http://localhost:1323/status/diagnostics
```

```
GET http://localhost:1323/internal/network/v1/transaction
```

## Reconfigure node

```
docker-compose down / ctrl-c
```

edit config/node/nuts.yaml

```
network:  
  enabletls: false  
  bootstrapnodes:  
    - "192.168.1.10:5555"  
    - "192.168.1.20:5555"
```

```
docker-compose up
```

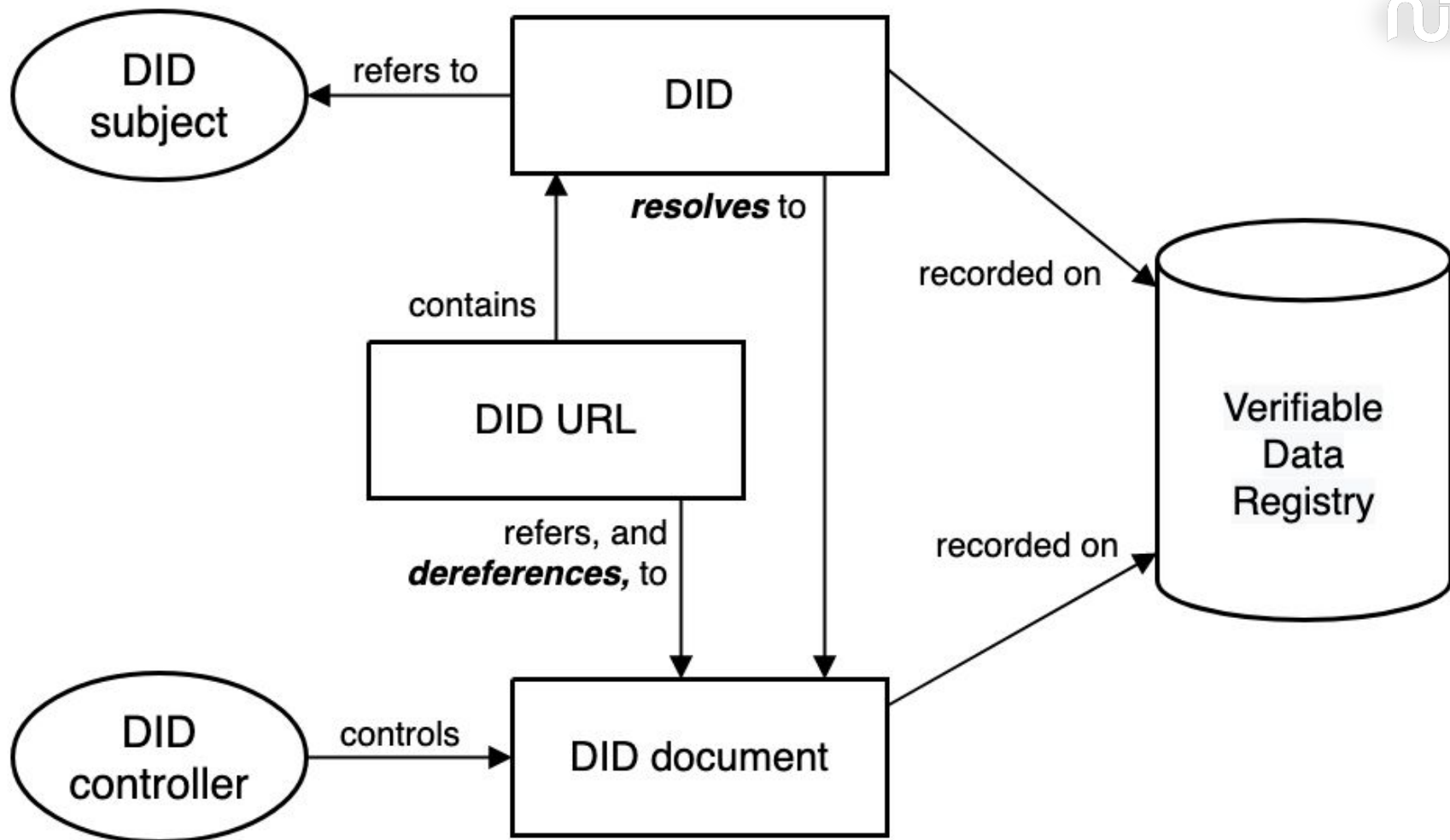
## Check status

```
GET http://localhost:1323/status/diagnostics
```

```
GET http://localhost:1323/internal/network/v1/transaction
```

# Decentralized Identifiers (DIDs)





# DID

DIDs are URIs that associate a DID subject with a DID document allowing trustable interactions associated with that subject.

**Scheme**  
└─  
**did**:**example**:123456789abcdefghi  
└─┬─┘ └──────────────────────────┘  
DID Method DID Method-Specific Identifier

# DID Method

A DID method specification states how a **DID Document** is **created**, **updated**, **resolved** and **deactivated**. It must also state how **authorization** is performed for all of these operations.

# Verifiable Data Registry

The place to record and resolve DIDs and DID Documents. It can add some metadata (versioning, timestamps, history) to the DID Documents. Every DID method had its own registry.

# DID nuts method

Example: `did:nuts:EgFjg8zqN6eN3oiKtSvmUuca04VF18m2Q9fftAeANTBd`

- Authorize: only owner of associated private key or controller
- Create: generate a new key-pair, sign transaction with that key, distribute using Nuts network
- Resolve: available in local Nuts node
- Update: update the same document, sign TX with valid private key
- Deactivate: sign and publish an empty document

## Create a DID

```
POST http://localhost:1323/internal/vdr/v1/did
```

```
GET http://localhost:1323/internal/vdr/v1/did/{did}
```

```
ls data/node/crypto
```

```
> did:nuts:{DID}_private.pem
```

```
docker logs single_node_1
```

```
GET http://localhost:1323/status/diagnostics
```

## View transactions

```
GET /internal/network/v1/transaction
```

```
GET /internal/network/v1/transaction/{ref}
```

```
GET /internal/network/v1/transaction/{ref}/payload
```

# Register vendor and contact info



Registry Admin

[You as a Service Provider](#)

[Your care organizations](#)

[Manage Credential Issuers](#)

[Care Organization Registry](#)

[Logout](#)

## Service Provider Configuration

A Service Provider offers (Nuts) services to its customers.  
Here you can update the contact information of your Service Provider.

DID

did:nuts:3wEb8GJEuenjMexQXKfrdAr8CvA69SdbVh8qhUpDMcX2

Name of the Service Provider

Wout care services

Support email address (required)

info@woutslakhorst.nl

Phone number

0612345678

Service Provider website

https://woutslakhorst.nl

[Update Service Provider](#)



## View contact info

Contact information is a DID service.  
See the result via:

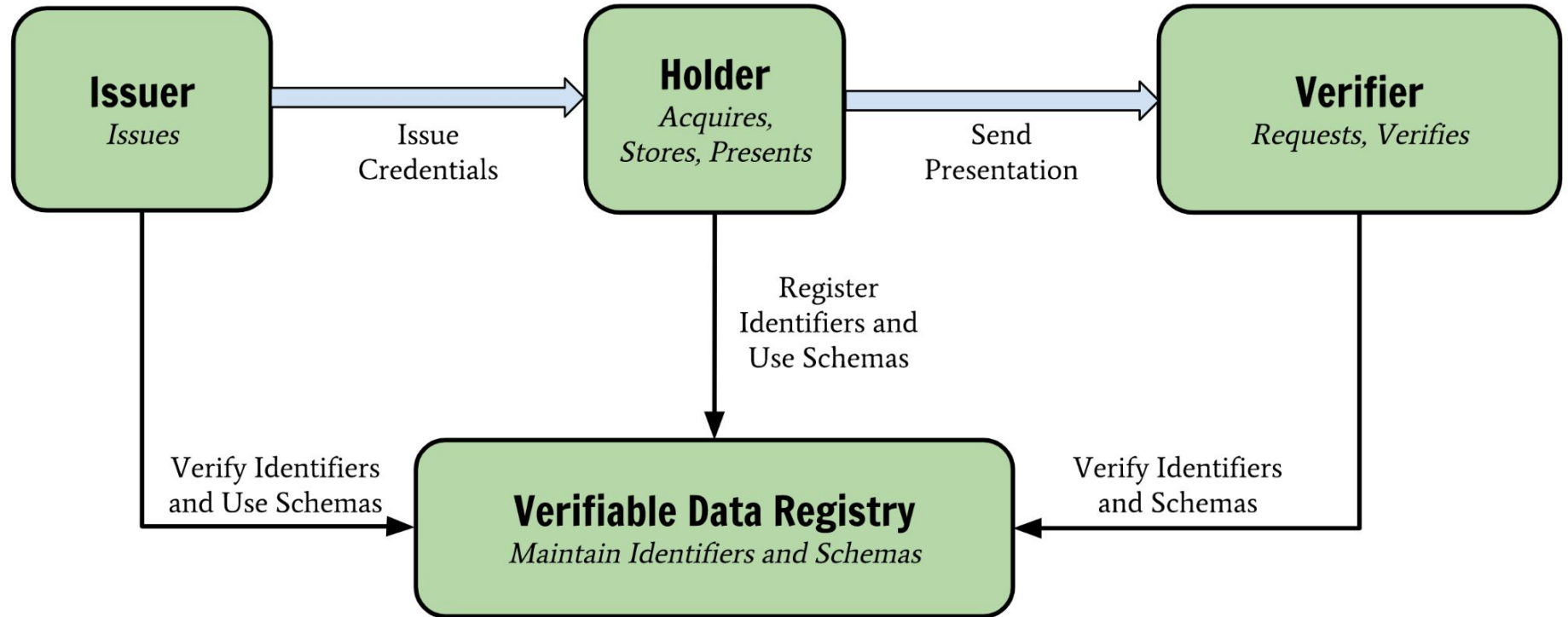
```
GET http://localhost:1323/internal/vdr/v1/did/{did}
```

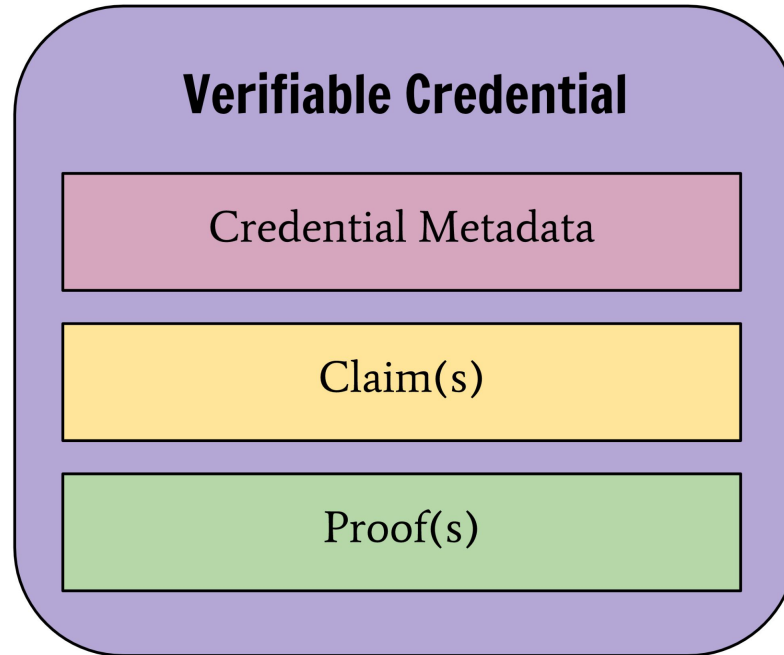
# Verifiable Credentials

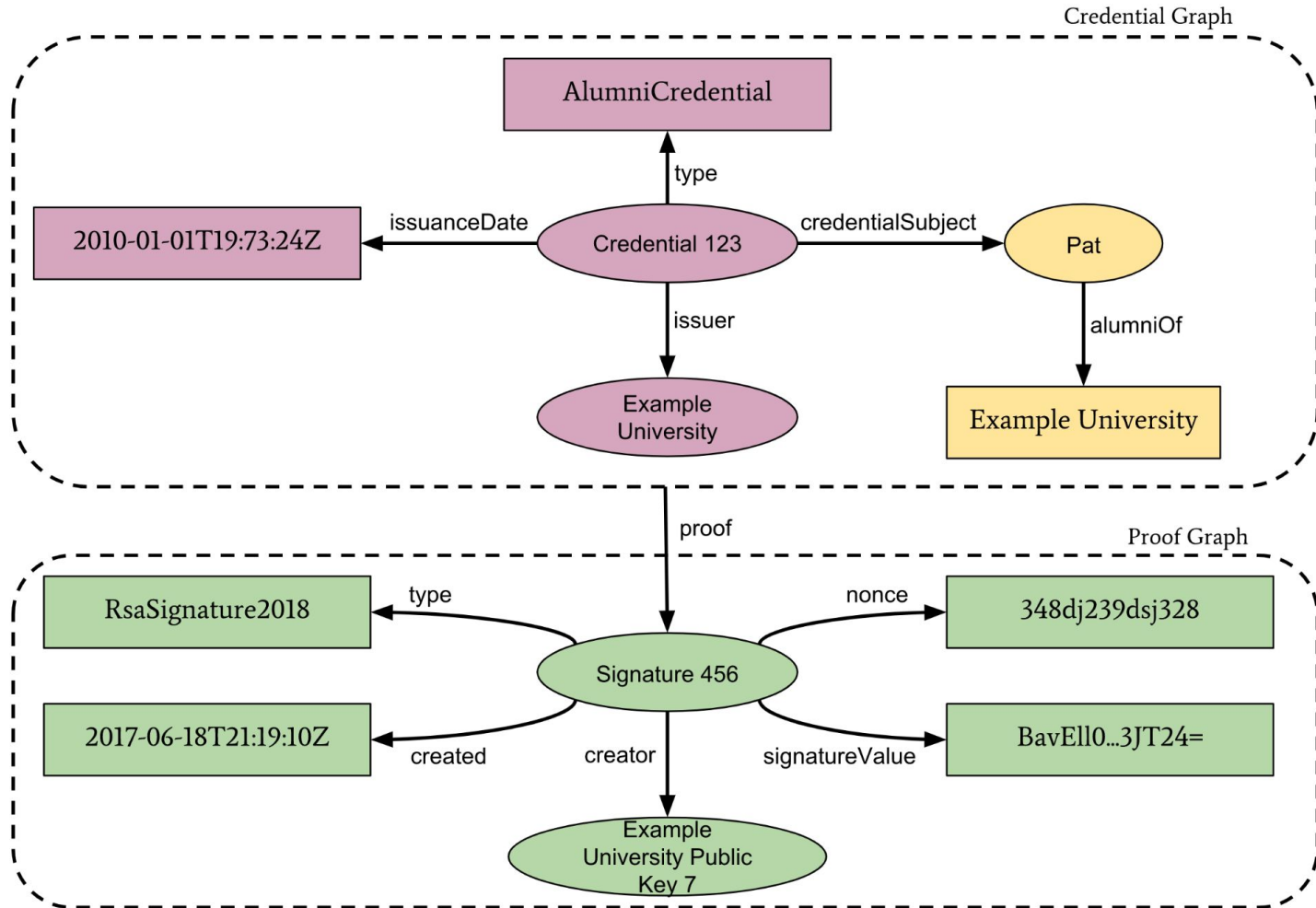
<https://www.w3.org/TR/vc-data-model/>

<https://nuts-foundation.gitbook.io/drafts/rfc/rfc011-verifiable-credential>

<https://nuts-foundation.gitbook.io/drafts/rfc/rfc012-nuts-organization-credential>







# Claims

May be anything:

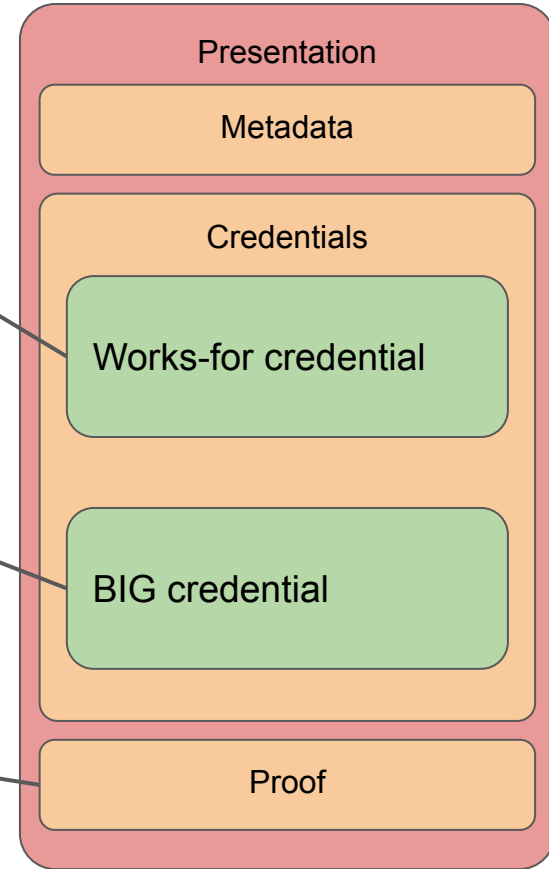
- Another identifier: *kvk, ura, uzi, agb, bsn, etc, etc*
- Identifying data: *name, place, date-of-birth*
- Qualifying data: *vaccinated: true*
- Relation data: *child-of*

“Support staff uses own credentials and DID to prove it acts on behalf of a professional without exposing their name.”

Issuer: professional-X  
Subject: support-X  
Claim: works-for  
Proof: ✓

Issuer: BIG  
Subject: support-X  
Credential: nurse  
Proof: ✓

Method: support-X  
Proof: ✓



# Trust

- Credentials do not work without trusted issuers
- Network must agree on method of trust:
  - Trust anchors
  - P2p trust
  - Limited validity of credentials
  - External sources



# Adding care organizations



Registry Admin

 You as a Service Provider

 [Your care organizations](#)

 Manage Credential Issuers

 Care Organization Registry

Logout

## Your care organizations

[+ Add](#)

CUSTOMER ID	NAME	CITY	PUBLISHED
1	CareBears	Enske	true

## Search for organizations

```
POST http://localhost:1323/internal/vcr/v1/organization
```

```
{
  "Params": [
    {
      "key": "organization.name",
      "value": "Care"
    }
  ]
}
```

You'll only find your own organization

# Trust

```
GET /internal/vcr/v1/NutsOrganizationCredential/trusted
```

```
GET /internal/vcr/v1/NutsOrganizationCredential/untrusted
```

# Adding trust



Registry Admin

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## Manage Verifiable Credentials

### NutsOrganizationCredential

did:nuts:3wEb8GJEuenjMexQXKfrdAr8CvA69SdbVh8qhUpDMcX2 - Wout care services	<input checked="" type="checkbox"/> Trusted
did:nuts:9fAa6rS928S3HdYnqYfpNgPQ1aFgxjj17e6aAw8gJHkq - DillenHealthcare	<input checked="" type="checkbox"/> Trusted
did:nuts:NDeaNdbzReyrXd9x1qDbeG3qCUBiHZsys7FUiMRwbZm -	<input checked="" type="checkbox"/> Trusted
did:nuts:2mF6KT6eiSx5y2fwTP4Y42yMUh91zGVkbu4KMARvcJz9 -	<input type="checkbox"/> Trusted
did:nuts:3Z2aduegbLZMSULUJPMuCXPIhMi8WLQA749Zfk2bXH6D - Nedap - Niels Bakker	<input type="checkbox"/> Trusted
did:nuts:3oknWiGB676x2zYt3EHv7H4bz9EgZE8xAZKnc9EFVAgP - ReinZorgt	<input type="checkbox"/> Trusted
did:nuts:63NMVeVM1EZdHkGc4EYYdWh3c1uvtUZo3Kuj63rgq7e5 - StevenSoft	<input type="checkbox"/> Trusted
did:nuts:6UgqnzXMVa9HzS59FmjVH5YUxDSAeYMeCVSjPVhMr98N - FridaySoft21	<input type="checkbox"/> Trusted
did:nuts:7xNjNvNEytAViJEC9BTt2gf9wmoyK15jSwTRSTzXmeUd -	<input type="checkbox"/> Trusted
did:nuts:8ifRzZqRdtA1WYytGbgGkF6ag6dYGmerb9WGNL8ppoga - Nedap - Local development	<input type="checkbox"/> Trusted
did:nuts:9EB62eoh7mnMzSjvbMTs5u88c4hoemraefaQPrjKGhyn - CurlCare	<input type="checkbox"/> Trusted

## DID service registration (1)

Absolute endpoint URL: `https://api.example.com/fhir`

Reference URL: `did:nuts:EgFj...NTBd/serviceEndpoint?type=fhir-prod`

Compound service:

```
"serviceEndpoint": {  
  "oauth": "did:nuts:123?type=oauth",  
  "fhir": "did:nuts:123?type=fhir"  
}
```

## DID service registration (2)

DID Vendor

DID organization

```
"type": "service",
"serviceEndpoint": {
  "oauth": "https://prod.example.com/oauth",
  "fhir": "https://prod.example.com/fhir"
}
```

## DID service registration (3)

DID Vendor

```
"type": "fhir",  
"serviceEndpoint":  
  "https://prod.example.com/fhir "
```

```
"type": "oauth",  
"serviceEndpoint":  
  "https://prod.example.com/oauth "
```

DID organization

```
"type": "service",  
"serviceEndpoint": {  
  "oauth": "did:nuts:123/serviceEndpoint?type=oauth ",  
  "fhir": "did:nuts:123/serviceEndpoint?type=fhir "  
}
```

## DID service registration (4)

DID Vendor

```
"type": "fhir",  
"serviceEndpoint":  
  "https://prod.example.com/fhir "
```

```
"type": "oauth",  
"serviceEndpoint":  
  "https://prod.example.com/oauth "
```

```
"type": "early-adopters",  
"serviceEndpoint": {  
  "oauth": "did:nuts:123/serviceEndpoint?type=oauth ",  
  "fhir": "did:nuts:123/serviceEndpoint?type=fhir "  
}
```

DID organization

```
"type": "service",  
"serviceEndpoint":  
  "did:nuts:123/serviceEndpoint?type=early-adopters"
```






# Adding services

## Endpoints

An endpoint is a simple registration of a named URL. It can be used as a building block for Services.

[+ Add](#)

TYPE	URL	DELETE
oauth	https://nuts.woutslakhorst.nl/n2n/auth/v1/accesstoken	
fhir	https://demo.woutslakhorst.nl/fhir	
task-notification	https://demo.woutslakhorst.nl/web/external/transfer/notify	


## Services

A service is set of endpoints which can be offered to customers.

[+ Add](#)

SERVICE NAME	ENDPOINTS	ACTIONS
eOverdracht-receiver	notification → did:SP-DID?type=task-notification oauth → did:SP-DID?type=oauth	 
eOverdracht-sender	fhir → did:SP-DID?type=fhir oauth → did:SP-DID?type=oauth	 

# Enabling services


**Edit Customer**

Nuts Network DID:

did:nuts:5vLpJpRP8KnQbTL4XC78VtfdNabwNGfDt'

Internal ID:

1

Name:

CareBears

City:

Enske

Domain:

☒ Publish by this name in Nuts network

Service configuration:

☒ eOverdracht-receiver

☒ eOverdracht-sender

Cancel

Save Customer

## Convenience APIs

```
POST /internal/didman/v1/did/{did}/endpoint
POST /internal/didman/v1/did/{did}/compoundservice
GET  /internal/didman/v1/did/{did}/compoundservice/
      /{compoundServiceType}/endpoint/{endpointType}
POST /internal/didman/v1/search/organizations
```

**GO NUTS!**