

# v5 -> v6 migration guide

This book contains various pages on what to do before/during and after migrating your node. This includes things on configuration, DID management, API usage and use case design.

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# Configuration update

When updating your node from V5 to V6, you can choose to disable/enable certain parts depending on your needs. The [common](#) paragraph describes the required configuration changes.

## Common

Before you update, make a backup and check the diagnostics of your node. To have the migrations run smoothly, make sure `vdr.conflicted_did_documents.owned_count` equals `0`. If not, please refer to the [documentation](#) on how to fix.

As stated in the [release notes](#), you MUST do the following configuration changes:

- add `storage.sql.connection` config value according to the [storage](#) documentation
- add `url` config value according to the [manual](#). The `auth.publicURL` has been removed and also uses that same config value.
- when using docker, make sure user ID 18081 has access to the mounted volumes.
- change port settings in the configuration and in your reverse-proxy. The new default is that [public endpoints](#) are bound to `:8080` and [internal endpoints](#) to `127.0.0.1:8081`.
- change reverse-proxy configuration to allow/disallow the correct endpoints. (See also later paragraphs)
- remove legacy internal API tokens and migrate to new API tokens if applicable.

## Without additional features

You can disable the `did:web` method and only use the `did:nuts` method (like in v5) by adding the `didmethods` config param:

```
didmethods: [nuts]
```

Keep using the VDR v1 API for did document updates and the auth v1 API for access token requests. The V6 Nuts node exposes more paths to the public interfaces. These are only used by new features. If your reverse-proxy is configured correctly you block any unwanted paths already. The following paths resolve to APIs in V6:

- /iam
- /oauth2
- /.well-known
- /statuslist
- /discovery

Note: although some features may be disabled, your did:nuts documents are still migrated to an SQL database and their controller is set to blank (self-controlled).

# Downgrade

It's possible to downgrade an v6.0.0 node back to v5.4.x. You'll also need to reset your configuration. The SQL database you configured for V6 can be removed. DID documents are still changed after the downgrade with the controller field removed.

# DID management

When you upgrade from V5 to V6, your DID documents will be migrated to a SQL database. A new VDR V2 API has also been added. It's no longer possible to set a controller on a DID document. All DID Documents are *self-controlled*. It's also no longer possible to fine tune key usage. You can add or remove a key from a DID document but can't control if it's used for changing the DID document or signing data. The only exception is encryption keys which will be added in a later version.

In V6 you register **subjects** not **DIDs**. Existing **did:nuts** identifiers will be migrated to subjects (with the same ID). Operations done on subjects through the VDR V2 API will affect all supported DID documents (currently web and nuts).

With V6, we also promote a different way of registering services: on the **discovery service**. Previously, you registered services in the DID document and might even use references between DID documents to control a set of endpoints. There's a international tendency to only register public keys in the DID document. Also with the introduction of **did:web**, DID documents are not signed. This difference is reflected by the VDR V2 API which won't add services to **did:web** documents, only to **did:nuts** documents.

Given all of the above, you might have a challenge if your adding a V6 style use case to your existing set of V5 use cases:

- Which DID methods do you enable?
- Should existing **did:nuts** subjects get a **did:web**?
- When and how to switch to the new VDR V2 API?
- When to switch from DID document services to service registration on the discovery service?

The V6 release notes state that you should not use the VDR V1 API together with the VDR V2 API. This is a general statement to prevent runtime problems. The V1 API only transforms **did:nuts** documents and not **did:web** documents. So if you're using **did:web** in use cases, you should no longer use the VDR V1 API.

The problem can be broken down in two parts:

- Create/Delete/KeyCreation operations on DID documents (subjects in V6)
- Service registration

## Automatic migration

On startup, if both **did:web** and **did:nuts** are enabled, a **did:web** DID will be created for each **did:nuts**. The subject can then directly be used in use cases that require **did:web** DIDs.

But, if you change the `url` property of the Nuts node (e.g., due to misconfiguration), this won't automatically recreate or change existing **did:web** DIDs. If this happens, you have to manually delete the **did:web** DIDs and restart the Nuts node:

```
delete from did where did like 'did:web:%'
```

The **did:web** DIDs will then be recreated again on startup.

Note: Each time you restart the node, all changes to **did:nuts** will be migrated to **did:web** if they are not in sync.

## Create/Delete/KeyCreation migration

The Create/Delete/KeyCreation operations are done with the following API calls:

- POST `/internal/vdr/v2/subject`
- DELETE `/internal/vdr/v2/subject/{id}`
- POST `/internal/vdr/v2/subject/{id}/verificationmethod`

After updating your node to V6 you may choose the moment you change these operations to the new VDR V2 API. After you've made the transition, restart the node once to make sure any **did:web** document is in sync with the **did:nuts** document for the subject. Any service registration in a **did:nuts** document will not be copied to the **did:web** document.

You might also want to change the designation of the identifier you store in your own DB, it used to be a DID, now it's a subject. After the transition you're also able to choose your own identifier.

## Service registration

For service registration it's recommended to create a new separate management page for the discovery API. That way the old management page can use the VDR V1 service operations and the new management page can use the discovery API. Both can coexist, even for the same subject. It's then still recommended to switch the old management page to the new VDR V2 API.

Being able to register service on the discovery service does not solve the problem how a use case migrates from V5 style to V6 style services.

## Recommendation

Given the little amount of work in migrating the VDR API and usage of **did:web**

- update your node to V6 with **did:web** disabled (at least for staging/production)

- switch all VDR V1 API calls to the VDR V2 API in a big bang
- enable **did:web**
- add a new management page for service discovery to support new use cases
- Never use DID Document service registration on use cases which support **did:web**

# Use case migration

Together with V6 comes a new understanding of how data exchange should be secured across organization boundaries. Some of the concept, promoted by Nuts in the past, are no longer viable or don't make any sense anymore. V6 supports alternatives or this wiki describes how an alternative should be implemented.

Nuts defines the NutsAuthorizationCredential Verifiable Credential type. VCs of this type were used to authorize party A by party B. Then B had to check the contents of the VC when used. But since B issues these credentials based on some identity of A and knowledge of its own, it's actually enough to check the identity of A and this knowledge runtime as part of the authorization step. No credentials needed...

The Nuts network was used to transfer OrganizationCredential type VCs to every participant. These were used, in combination with the DID Document, to do service discovery. This mechanism contradicts the usage of VCs. VCs are to be held in a wallet by the holder. The service discovery mechanism replaces this mechanism.

User authentication was added to the access token request by signing some text with a means that supports signing. This links a real user to the organization that is doing the request. Development shows that signing is not yet a first class citizen and doing it properly conflicts with usability. A proper authentication procedure lets the user sign a challenge given by the authenticating party, this is usually the resource owner in healthcare data exchange. A user probably has to fetch data from multiple sources per patient. With a proper procedure this would result in a lot of authentication challenges. A more future proof model is when the user authenticates with its IdP. Multiple IdPs could form a federation where they trust eachothers proces. Additionally the ID token could be inspected by each relying party to obtain VCs presented at login.

## Authorization

The biggest difference between a *V6 style* and *V5 style* use case is the way authorizations are handled. Authorization has always been the responsibility of the implementer. The Nuts node only provides assertions connected to an access token. With the NutsAuthorizationCredential these assertions could be quite "rich". They listed resources and access rights. When doing a *V6 style* use case you need to get this information from somewhere else. If all is well, you already have this information in a DB, since the NutsAuthorizationCredential is only a representation of the authorization state. Use identifying information from the token introspection (organization name/city/id) to query your own database for allowed resources.

# Service discovery

Service discovery in a *V5 style* use case depends on publication of `NutsOrganizationCredentials` and services in DID Documents. This is replaced for *V6 style* use cases to a registration with a central service (per use case). This has some pluses and minuses. The hardcoded requirement for a `NutsOrganizationCredential` and dynamic requirement for service types in a DID Document has been replaced by a flexible configuration. Per use case a service definition is published. This definition contains a *Presentation Definition* which specifies the required Verifiable Credentials, required endpoints and trust anchors. The trust API is no longer needed for *V6 style* use cases. From a client app point of view, you no longer register endpoints on a DID Document to enable a use case, but you call the Discovery registration API to enable a use case for a subject (and thus a DID). The registration API allows arbitrary key/value pairs which can be used to register endpoints. This also allows for more fine grained control over your registration, for example only register the receiver role for a use case. Once registered, the Nuts node will continue to refresh the registration periodically. The main downside of this mechanism is that a use case needs to select a single party to host the discovery server. The Nuts node acts as a server so each use case participant can fulfill this role.

## Todo

differences:

- trust configuration
- endpoint search
- token requests (including policy definition)
- token introspection
- did method support
- user auth

order:

- determine trust and security baseline
- determine policies
- determine service registration params/vcs
- all updated to v6
- all migrate away from authorizing through `NutsAuthorizationCredentials`
- all support new access tokens and token introspection
- all register on discovery service (did:web)
- V6 style client interaction (discovery search, token request with XIS/ECD user info)
- Remove old service registration from DID documents
- Remove old authorization logic