

# Digital identity wallets: a technical overview

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**[The digital wallet overview](#), introduced in this blog, helps businesses, developers and end-users to decide which wallet to use for their business case.**

Citizens have to prove things about themselves in many stages of their life. From registering the birth of a child, to writing down one's last will; from going to a hospital to applying for a mortgage. As more and more of these transactions are digitalized, the urgency for proper digital wallets has vastly increased. On top of that, through the European regulation (eIDAS 2) it has been decided that, by 2024, every EU citizen should have the possibility to be provided with a Digital Identity (EUDI) by its own state. This has resulted in the growth of a true digital wallet jungle. In this blog, an open source, easily maintainable [digital wallet overview](#) is presented, which has recently been accepted by the [Open Wallet Foundation](#) to be maintained by [a designated Special Interest Group](#), to get a technical overview of the different wallets available.

## Another business case: another wallet!?

Currently, tens, if not hundreds, of different digital wallets are being developed for all kinds of use cases. The number of wallets and the diversity of wallets is so large, because it is very complex to build one wallet that is suitable for all use cases. Different use cases ask for a large variety of wallet requirements, like wallet availability (web and/or mobile), user experience, privacy level, security level, interoperability et cetera. So, most wallet builders focus on creating a business model around a specific set of use cases or within a specific community.

Consequently, these wallets differ in a lot of technical aspects, like credential exchange protocols, encoding schemes, identifier systems, key management, peer-to-peer protocols and more. Some of the implementation choices made by wallet vendors can be found on their websites, but often this information cannot be found publicly. Therefore, a survey was sent to forty well-known wallet vendors with the request to supply us with the correct technical information. From this form an open-source overview was created.

## Focus: well-supported generic citizen wallets

We think that such an overview would have most value to the community if it is open source, modular, easily maintainable and updatable by wallet vendors themselves. As we all know: developers love developing! Therefore, the overview is maintained on [Github](#) (see screenshot below).

To give reasonable focus to the overview, the set of wallets included had to be limited. The first choice was to include the more generic wallets. Wallets that are designed only for managing cryptocurrencies or wallets designed for only one use case or one ecosystem are not included. The second point of attention is support: a wallet is only included when it currently is (or will soon be) supported. Moreover, its support should not end in the foreseeable future. Thirdly, up till now only holder wallets were included, and issuer and verifier agents, organizational wallets and cloud-based wallets were mostly excluded. Whether more wallets will be included later, will be discussed in the Special Interest Group.

Wallet	Credential Format	Encoding Scheme	Signature Algorithm	Holder Identifier	Issuer Identifier	Revocation Mechanism	Peer
CertiShare Wallet	AnonCred, JSON-LD	JSON	BBS+	did:	did:sov	Indy revocation	DIDCom
Connect.Me	-	-	-	-	-	-	
Data Wallet	AnonCreds, VC(?)	JSON	CL, ES256	did:ebsi, link secrets, X.509	did:ebsi, did:sov, X.509	Indy revocation, EBSI revocation	OIDC, SI
Datakeeper	LDP-VC	JSON-LD	ECDSA	did:eth	did:eth	Validity credential, Revocation not su...	
DID-Wallet	-	-	-	-	-	-	
Digital ID Wallet	-	-	-	-	-	-	
esalus Wallet	AnonCred	JSON	CL	Link secret	Link secret	Indy revocation	
Gataca	LDP-VC, JTW-VC	JSON-LD	EdDSA, RSA, secp256k, P-256, CadEs	did:key	did:gatc	Status List 2017, Status List 2021	
Gimly ID*	-	-	-	-	-	-	
helix id	JWT, JWT-VC	compact and JSON serialization, JSON, JSON-LD	BBS+, ECDSA	did:key, ENS, did:eth	did:key, ENS, did:eth	DID Revocation	OIDC, DI
IDEMA	-	-	-	-	-	-	
idento.one	-	-	-	-	-	-	
Identry	AnonCred	JSON	CL	did:sov	did:sov	Indy revocation	

The Figure shows part of the digital wallet overview, which contains technical information on interoperability, security, privacy, user-friendliness (in the columns) from more than 20 wallet vendors (in the rows). More specifically, in the columns the credential format, encoding scheme, signature algorithm, holder identifier, issuer identifier and revocation mechanism are listed.

### Insights and further work

The request for technical information was sent per mail and shared openly on LinkedIn. Over twenty vendors responded. The responses showed how many choices there are to make in the design of a digital identity wallet. As a result, the form used was not fully suitable for all wallet vendors. For example, when asking for information about the credential profile used, the responder was only offered room to write down one credential profile. However, most wallet vendors build their wallets such that multiple credential profiles can be supported by one wallet alone. Another observation is that some wallet vendors indicated that they are discontinuing their wallet. Their reason for this is mostly because of a lack of finances and a market for their product. Remarkably, the early SSI wallet trendsetter Trinsic also announced that they will soon drop the support of their Trinsic wallet v1 and switch their business model over to offering software development kits for specific use cases.

Since the overview has been put online, it has been presented at [DICE#1](#) in June 2023. This has resulted in a fruitful collaboration with [Findynet](#), who has expanded and improved the existing overview. We are glad to announce that we are donating the overview to the Open Wallet Foundation where we will continue improving the overview in collaboration with others in the Special Interest Group. If you have any questions or have new information to put in the overview, please join [the Special Interest Group](#), contact us, or create an issue or pull request on [Github](#).

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