

SCS 2024-12-05

Sovereign Cloud Stack: An honest review and outlook

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<https://scs.community/>
<https://github.com/SovereignCloudStack/>

Free & Open Src SW gives power to society

2020: Open Source is incredibly successful

- Lots of appliances run OSS (TVs, Access Points, ...)
- Android
- Most of the internet-facing services
 - Even on Azure >>50% of the VMs run Linux
- Incredible speed of innovation
 - Enabled by „permissionless innovation“ inherent to Open Source
- Open Source is the default way of collaborating
 - „Inner Source“ within corporations



State of Infrastructure platforms



IBM **Cloud**



- They all use a large amount of open source code
- They are all proprietary
 - You can not change the platforms
 - You can not run them yourselves (except VMware – if you can still afford it)
 - Innovation defined by single vendor that you depend on
- Lock-In



We could do better ...

- **Most pieces to build competitive Infrastructure platforms are available as mature OSS technology**
 - Even the Hyperscalers use many of them
- **We have failed to align to create one (or a few) standardized stacks**
 - Too much fragmentation
- **Integration and standardization tasks**
- **Operational standards and skills missing**

One platform - standardized, built and operated by many.



Sponsoring for our idea ...



SPRIN-D

Very supportive.
Fast to support project with paid research contract.
Good advice for first supported project.



BMWK

Very supportive.
Bound by slow alignment and decision processes.
Lots of projects ...

Vorhabenbeschreibung

(zur vertraulichen Behandlung)

Zum Projekt GAIA-X



Vorhaben: Sovereign Cloud Stack

Akronym: SCS



Schlagworte zum Vorhaben:

GAIA-X, SCS, Digitale Souveränität, Infrastruktur, Cloud, Föderierung, Open Source, Infrastructure as Code, OSB Alliance

Antragsteller:

Open Source Business Alliance – Bundesverband für digitale Souveränität e.V.
Breitscheidstr. 4
70174 Stuttgart

Fon: +49 711 90715-390
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vertreten durch:
Peter Ganten (Vorstandsvorsitzender)
E-Mail: ganten@osb-alliance.com

Version: 2020-12-21

Funding proposal (12/2020)

Collaboratively written in .rst and managed with git.

Huge work items master spread sheet, extracted data with python (ODSReader) into doc. Needed several times, e.g. when we discovered that we can not deduce VAT.

Also handed in offers to substantiate cost calculations and avoid money to be locked. (1st year only, not very successful ...)

6 months till notice of funding
Lost money and people.

Sovereign Cloud Stack Deliverables



Certifiable Standards



Modular Open Source
Reference Implementation

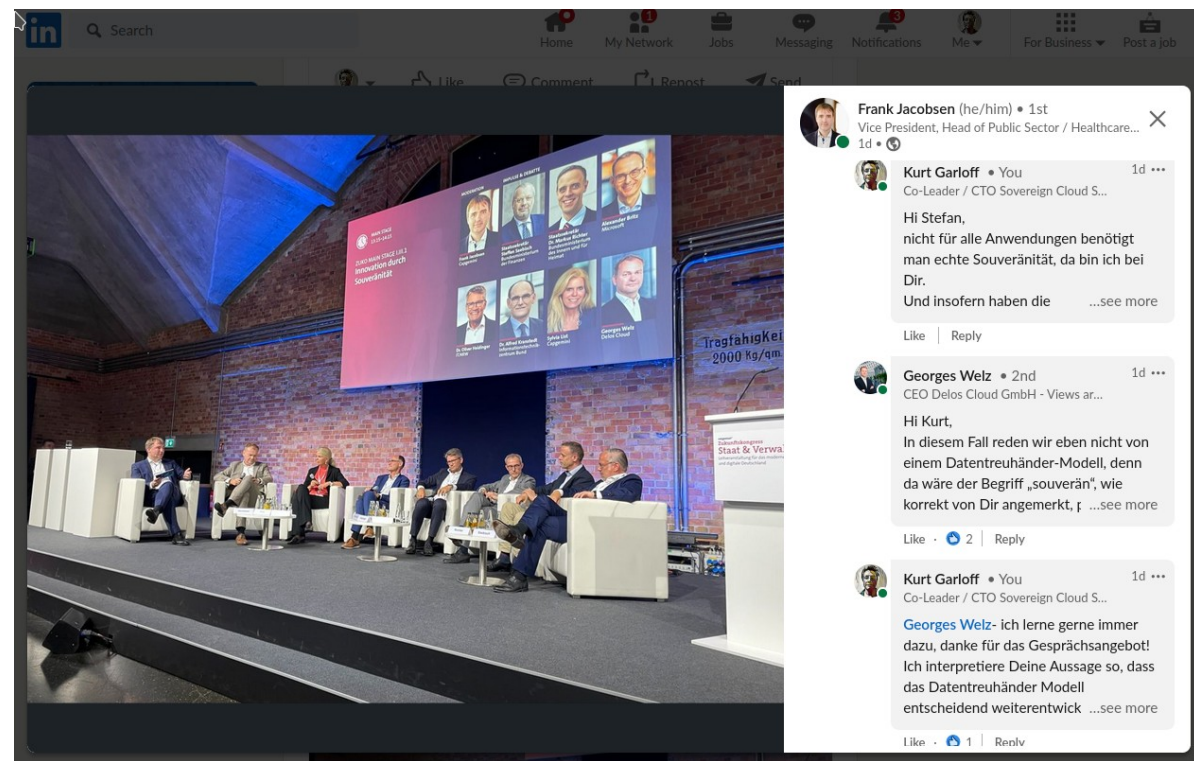


Operational Knowledge

Sovereignty debate

Sovereignty has become a marketing term :-)

- Providing data protection (GDPR compliance) is a good start ... “data sovereignty”.
- Ability to chose (without redoing automation/integration)
 - Ability to use many providers and federate
 - Requires standards/compatibility
SCS-compatible
- Ability to shape technology and innovate “technological sovereignty”
 - Requires 4 Opens
SCS-open
- Skills to understand and operate infrastructure
 - Open Operations
SCS-sovereign



Digital Sovereignty & SCS Certification

Levels of digital sovereignty

4: Operational Transparency and accessible Knowledge (Skill building)

3: Technological Transparency and ability to contribute and shape

2: Choice between many operators, insourcing option (on-premise)

1: Compliance with regulation (GDPR)

SCS Certification Level

4: “SCS-sovereign” – Ops/IAM stacks are OSS; transparency on monitoring and incidents, contribution to Open Operations (5 Opens)

3: “SCS-open” – SBOM for functional stack available and fully OSS (4 Opens)

2: “SCS-compatible” – technical compatibility (conformity tests from CNCF, OIF, SCS)

1: (Not SCS-specific): ENISA/Gaia-X labels & legal rules



SCS Standards



Introduction

Certification ▼

Scopes and Versions ▼

SCS Compatible IaaS

SCS Compatible KaaS

Standards ▼

Global ▼

scs-0001 ▶

scs-0002 ▶

scs-0003 ▶

scs-0004 ▶

scs-0112 ▶

IaaS ▼

scs-0100 ▶

scs-0101 ▶

scs-0102 ▶

scs-0103 ▶

scs-0104 ▶

scs-0110 ▶

scs-0111 ▶

KaaS ▼

scs-0200 ▶

scs-0210 ▶

scs-0211 ▶

scs-0212 ▶

scs-0213 ▶

🏠 > Standards

Overview

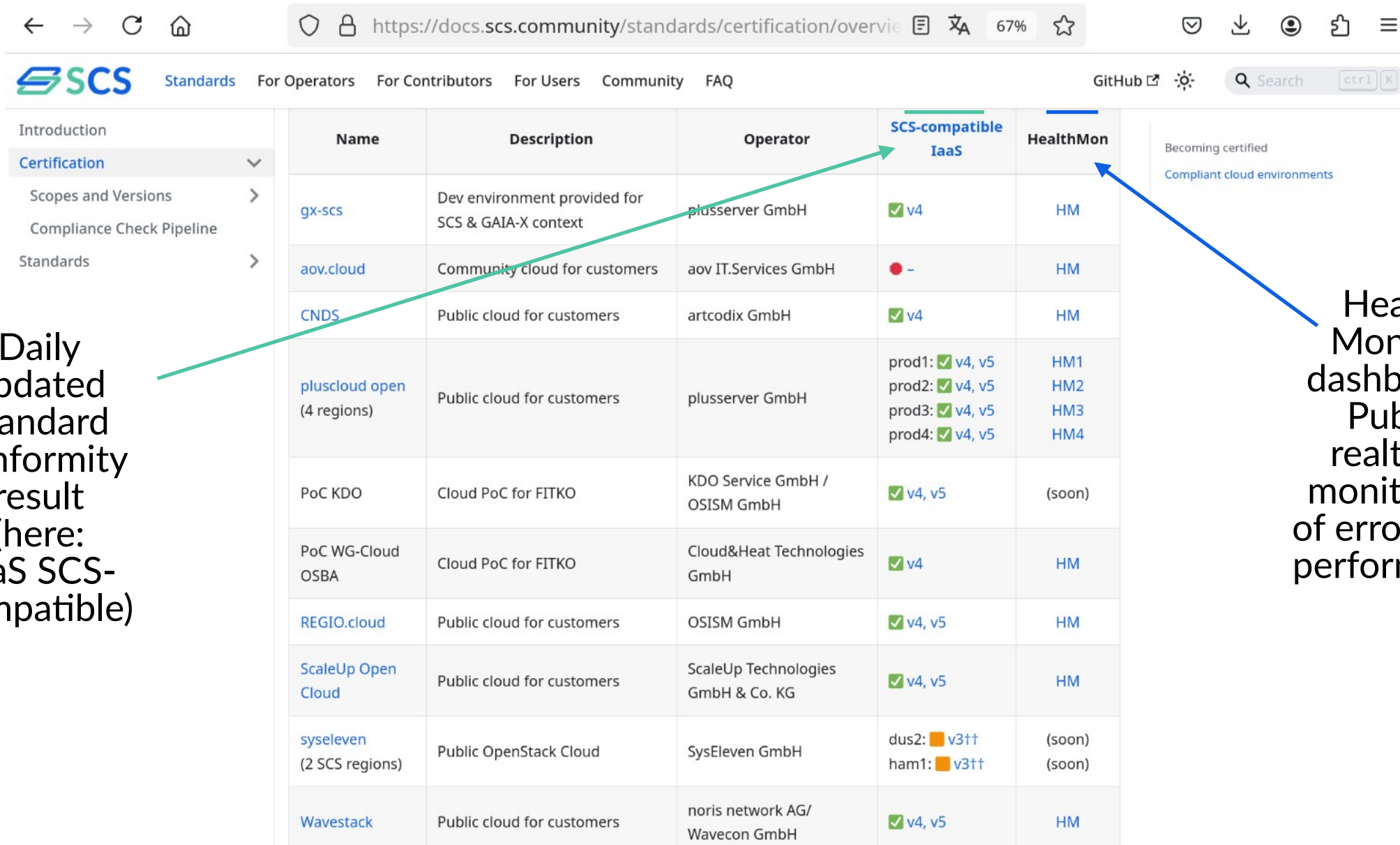
Standards are the core deliverable of SCS. By standardizing the open source software components of a cloud computing stack, their versions, how they are to be configured, deployed and utilized, SCS guarantees the reproducibility of a certain behavior of this technology.

SCS standards are discussed, developed and maintained in the community by the corresponding teams (see Track in the table below), which naturally include existing users of SCS.

*Legend to the column headings: Draft, Stable (but not effective), Effective, Deprecated (and no longer effective).

Standard	Track	Description	Draft	Stable*	Effective	Deprecated*
scs-0001	Global	Sovereign Cloud Standards	-	-	v1	-
scs-0002	Global	Standards, Docs and Organisation	v2	-	v1	-
scs-0003	Global	Sovereign Cloud Standards YAML	v1	-	-	-
scs-0004	Global	Regulations for achieving SCS-compatible certification	v1	-	-	-
scs-0112	Global	SONiC Support in SCS	v1	-	-	-
scs-0100	IaaS	SCS Flavor Naming Standard	-	-	v3	v1, v2
		Supplement: Implementation and Testing Notes	w1	-	-	-
scs-0101	IaaS	SCS Entropy	-	-	v1	-
		Supplement: Implementation and Testing Notes	w1	-	-	-
scs-0102	IaaS	SCS Image Metadata Standard	-	-	v1	-
scs-0103	IaaS	SCS Standard Flavors and Properties	-	-	v1	-

Existing public providers

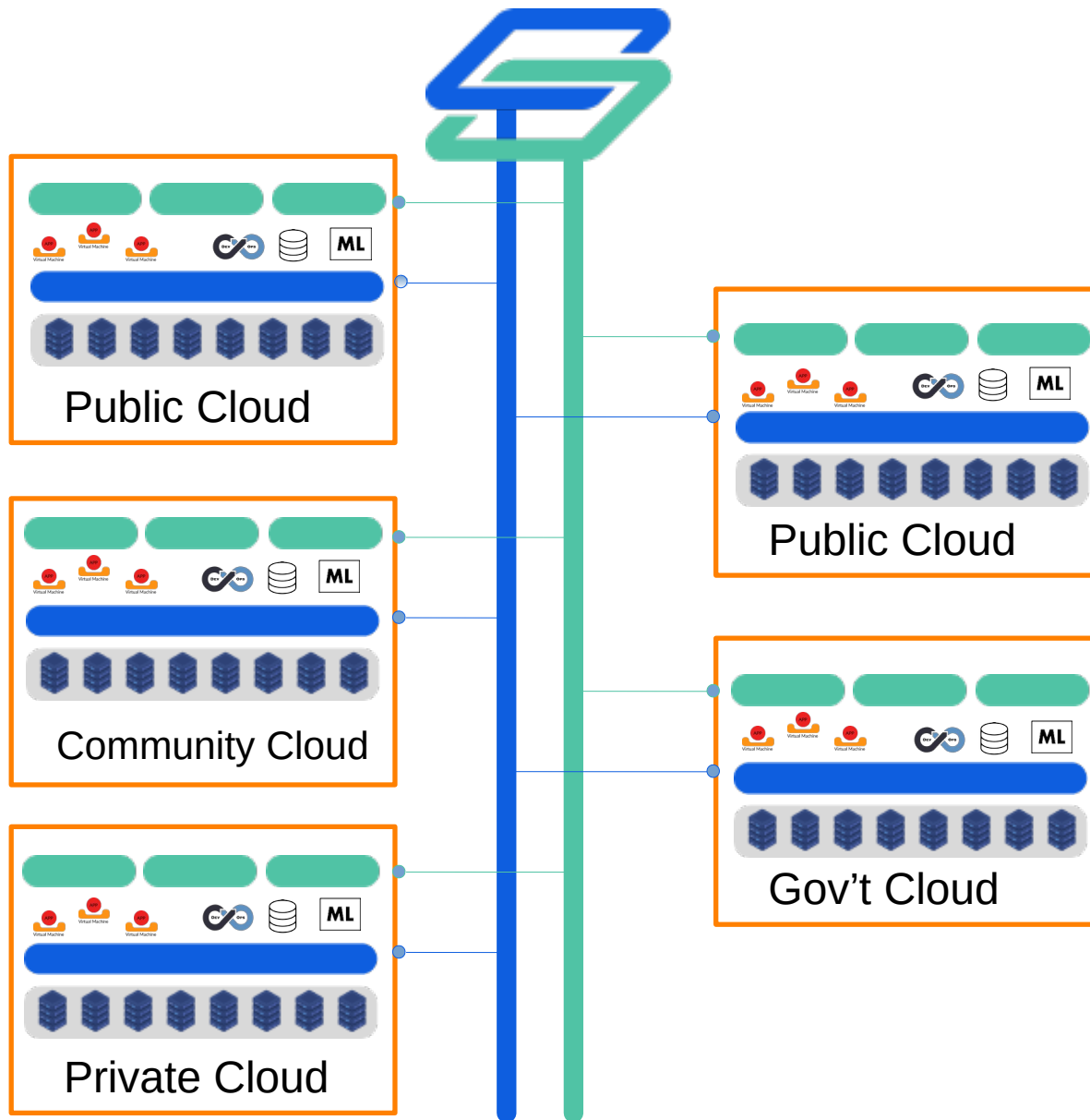


	Name	Description	Operator	SCS-compatible IaaS	HealthMon
	gx-scs	Dev environment provided for SCS & GAIA-X context	plusserver GmbH	✓ v4	HM
	aov.cloud	Community cloud for customers	aov IT.Services GmbH	● -	HM
	CNDS	Public cloud for customers	artcodix GmbH	✓ v4	HM
	pluscloud open (4 regions)	Public cloud for customers	plusserver GmbH	prod1: ✓ v4, v5 prod2: ✓ v4, v5 prod3: ✓ v4, v5 prod4: ✓ v4, v5	HM1 HM2 HM3 HM4
	PoC KDO	Cloud PoC for FITKO	KDO Service GmbH / OSISM GmbH	✓ v4, v5	(soon)
	PoC WG-Cloud OSBA	Cloud PoC for FITKO	Cloud&Heat Technologies GmbH	✓ v4	HM
	REGIO.cloud	Public cloud for customers	OSISM GmbH	✓ v4, v5	HM
	ScaleUp Open Cloud	Public cloud for customers	ScaleUp Technologies GmbH & Co. KG	✓ v4, v5	HM
	sysleven (2 SCS regions)	Public OpenStack Cloud	SysEleven GmbH	dus2: v3†† ham1: v3††	(soon) (soon)
	Wavestack	Public cloud for customers	noris network AG/ Wavecon GmbH	✓ v4, v5	HM

Daily updated standard conformity result (here: IaaS SCS-compatible)

Health Monitor dashboard: Public realtime monitoring of errors and performance

Federated Infrastructure



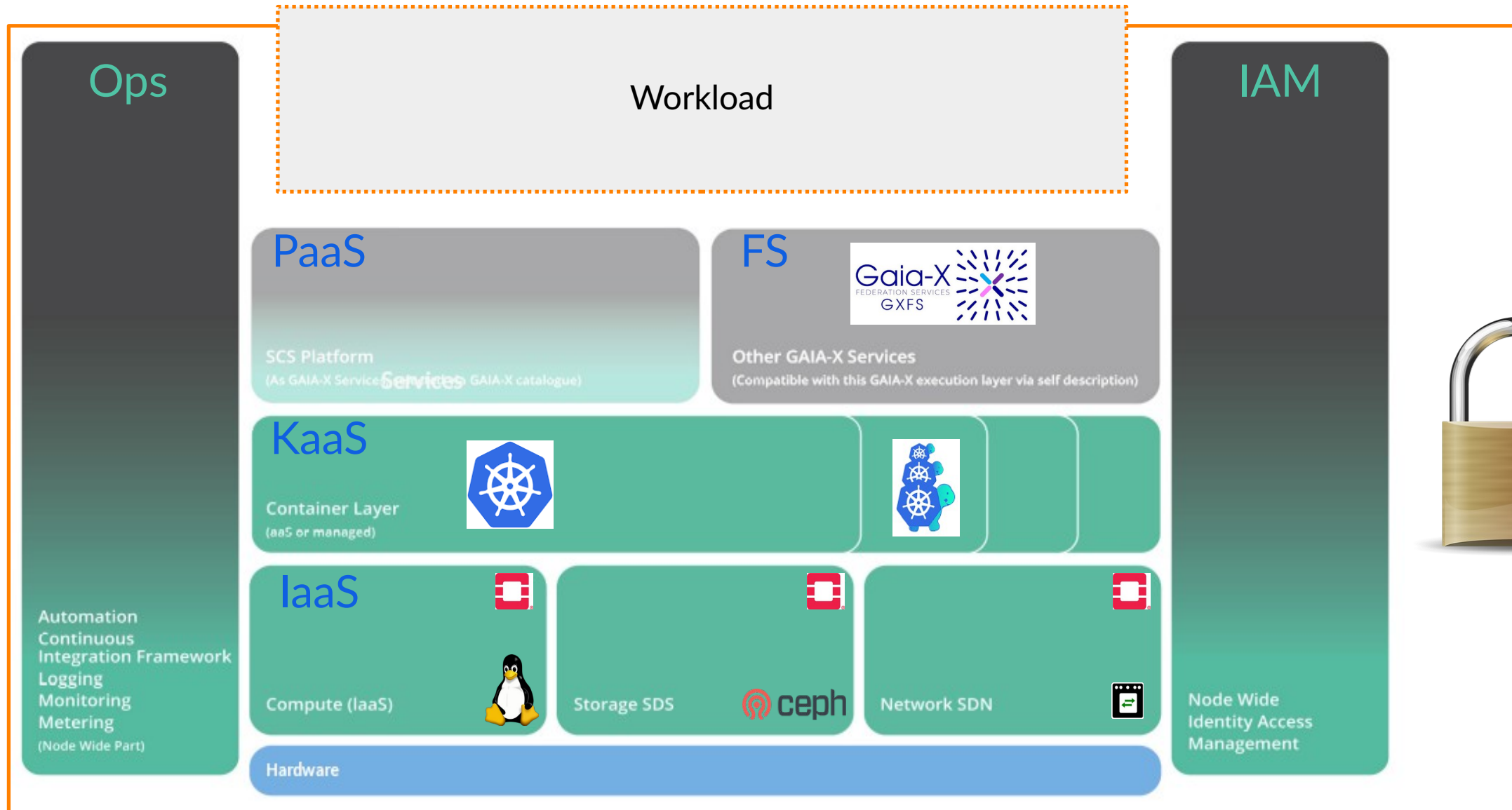
Built on Common standards
 ... for users of cloud services to enable mobility of workloads
 ... for cloud service providers to offer standardized lock-in-less services
 ... for the ecosystem to build knowledge and skills on a common technical and organizational foundation
 ... for solution providers that want to build on a common platform



SCS Software

SCS Architecture (Software/Ref.Impl.)

building it up from the ground



SCS Platform Services (PaaS) are planned
 Hardware and Federation Services not part of SCS software
 KaaS = Kubernetes as a Service



Tenders

#	Name	Description	Start date	Closing date	Link to contracting portal
1	OpsTooling, CI Tests Infra/iaaS, Metal as a Service, Life Cycle Management	Lot 1	2021-07-30	2021-08-20	SCS-VP01
2	Ops Best Practice Knowledge Base, CSP Transparency	Lot 2	tba	tba	tba
3	Storage Technology	Lot 3	2023-03-17	2023-04-10 T12:00+02:00	SCS-VP03
4	Networking	Lot 4	2023-02-28	2023-03-22	SCS-VP04
5	K8s aaS Integration	Lot 5	2022-09-27	2022-10-19	SCS-VP05
–	Container Network and Storage Integration	Lot 6a	2023-02-24	2023-03-20	SCS-VP6a-2
6	Container Network and Storage Integration	Lot 6a	2022-09-27	2022-10-19	SCS-VP6a
7	Container Meshing and Proxy	Lot 6b	tba	tba	tba
8	Container Registry / Scanning	Lot 6c	2022-06-29	2022-07-21	SCS-VP6c
9	Container Monitoring / IaC / CI / Deployment Automation	Lot 6d	2021-12-22	2022-01-19	SCS-VP6d
10	Container Tracing & Audit	Lot 6e	tba	tba	tba

Huge amount of work, completely underestimated.

Well structured, well-understood, risk minimizing thanks to legal advice.

Best case: 130d from spec to award. (We do several in parallel.)

Working on the tenders took 2.5y in project. Should have done less ...

Occasional failures: Low rates don't help.

Deutsches Vergabeportal

-  Contact
-  Newsletter
-  Support

Are you looking for public contracts?

Over 25,000 cross-portal public procurement notices daily from all sectors.

[Informations for tenderers](#)

Advantages for foreign tenderers

Learn how and why your business benefits from participating in public contracts in Germany.

[International tenderers](#)

English instructions

Our technical partner provides a quick overview of the functions and possibilities of the portal.

[Portal usage instructions](#)

Really open

Open has become a marketing term :-)

SCS Open Source Health Check

- Four Opens: Fully Open Source, Open Development, Open diverse Community, Open Design
- Maturity, Security & Maintenance
- Activity & Adoption

Github issues, PRs, project board, minutes, ...
Meets (Jitsi), Matrix, MLs,

Open Operations

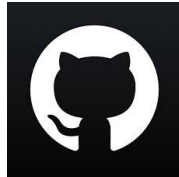
Joint knowledge building for excellent operations

Upstream first!

Healthy community with tender contractors, CSP employees, volunteers



Open
Source



 **CLOUD NATIVE**
COMPUTING FOUNDATION

Open Operations


Joint knowledge building for excellent operations

Upstream first!

Healthy community with tender contractors, CSP employees, volunteers

 OpenInfra
FOUNDATION

Four Opens

 OpenInfra
FOUNDATION



Open
Operations


 THE
LINUX
FOUNDATION



SCS Knowledge



← → ↻ 🏠 🔒 https://docs.scs.community 🔍 50% ☆ 📄 📥 👤 📌 ☰

 Standards For Operators For Contributors For Users Community FAQ GitHub ⚙️ 🔍 Search

Welcome to the SCS Documentation

Find user guides, code samples, deployment examples, reference, community pages and more.

Introduction to SCS Get to know SCS better and learn about the background. Get Started	Releases SCS is currently in Release 7. Check out the latest Release Notes. Learn More	Frequently Asked Questions You are curious what SCS is all about, what it can do and what it can't? Get Answers	Existing Public Clouds There are SCS compliant public clouds in production. Test Them
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Architectural Layers

Ops Layer Tooling and infrastructure design for easy, efficient and transparent ways to operate an SCS Cloud. Learn More	Container Layer SCS offers a robust solution for managing container workloads on a Kubernetes infrastructure. Learn More	IAM Layer Working on Keycloak federated identity provider within our Team IAM. Learn More
	IaaS Layer SCS offers OpenStack infrastructure solutions based on KVM virtualization to deploy VM workloads and enabling the container layer optionally. Learn More	

Additional Resources

Get in touch Come into our Matrix Chat in the SCS Tech Room. Join Now	Come to our Meet-Ups Our working groups and special interest groups meet weekly or biweekly. When? Find out within our public community calendar.	Standardization in progress Get to know our current Decision Records and Standards. Start Now	Deployment Examples Get to know different ways to deploy SCS with cloud resources or on bare metal. Explore Cases
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<https://openoperations.org/>

We build a community of practice

Open Operations builds a community of practice to keep the barrier to entry low and create a thriving environment for comfortable exchange.

We share knowledge

The availability of knowledge and skilled engineers is the limiting factor for many organizations to adopt, leverage, and successfully operate complex technology.

We're transparent about our incidents

We firmly believe that failures make us experts. The way we handle mistakes is how we become better.

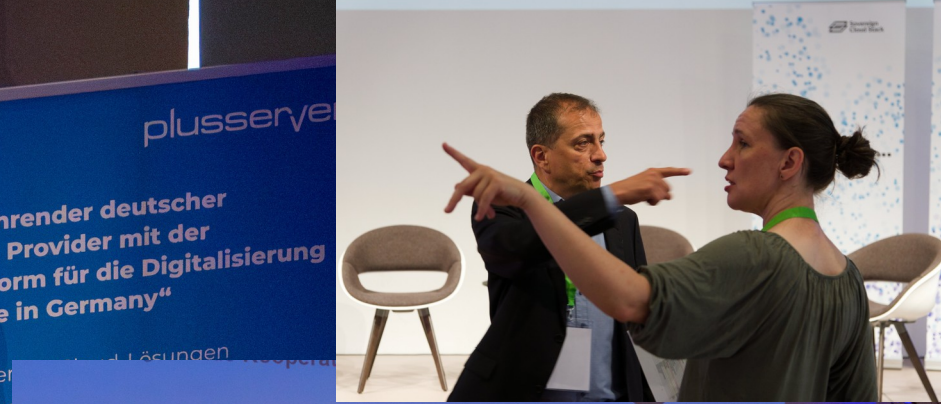
We're transparent about our operational processes

We share our internal processes for the sake of transparency. We firmly believe that transparency leads to better and more reliable processes.



SCS Adoption

SCS Summit 2024



Supporting companies and organizations



23 Technologies				
SPRIN-D				
				+BASF
				+TLRZ
				+sys eleven
				+LinuxHotel

Upcoming:

Existing CSP	Future CSP	SCS compat	Impl. Partner
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Flexible, secure,
digitally sovereign
office collaboration
solution

Standardized, secure,
digitally sovereign
infrastructure

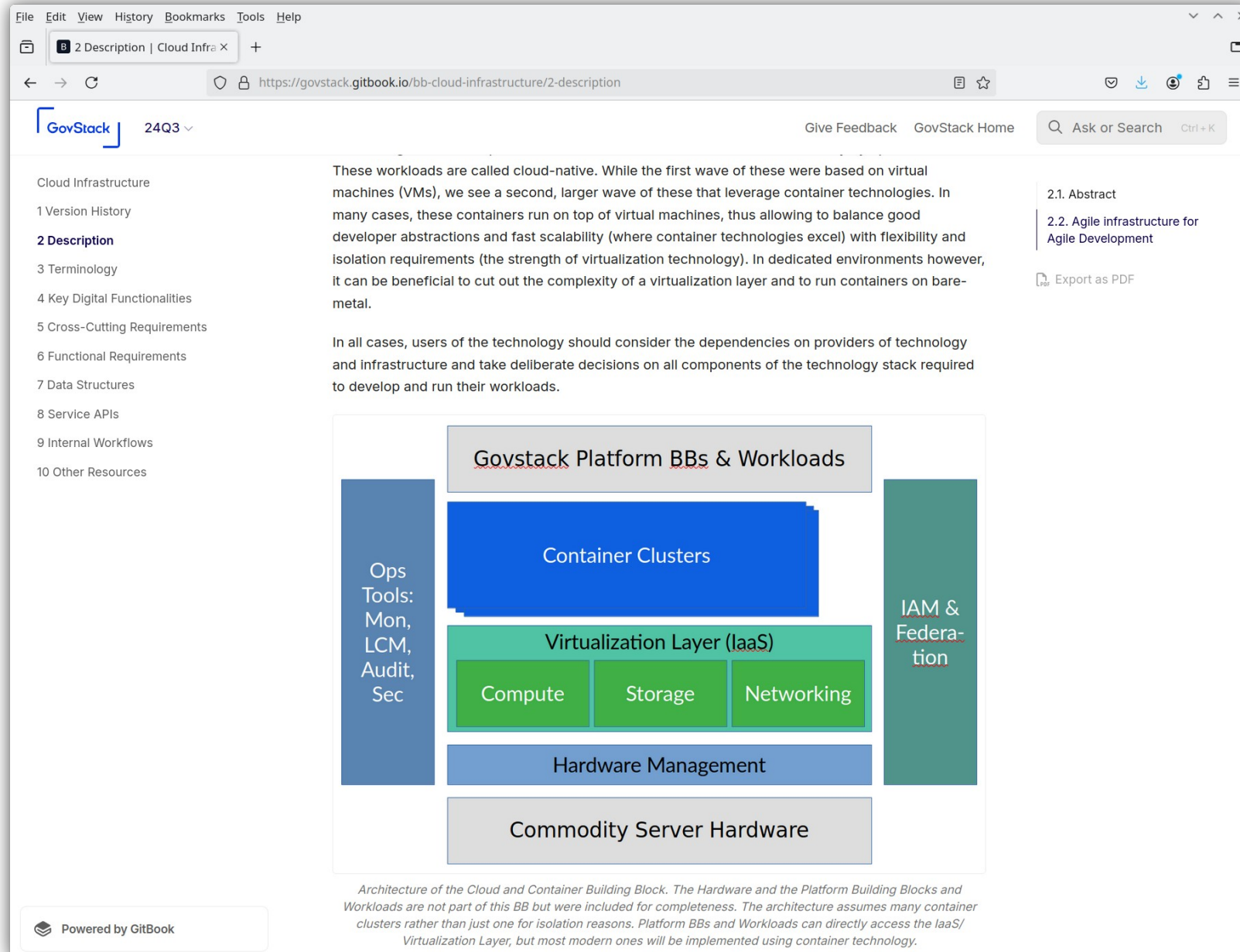


SCS Future

GovStack Specs for Cloud Computing



<https://govstack.gitbook.io/bb-cloud-infrastructure>



The screenshot shows a web browser window with the URL <https://govstack.gitbook.io/bb-cloud-infrastructure/2-description>. The page content includes a table of contents on the left, a main text area, and a diagram of the cloud architecture.

Table of Contents:

- Cloud Infrastructure
- 1 Version History
- 2 Description**
- 3 Terminology
- 4 Key Digital Functionalities
- 5 Cross-Cutting Requirements
- 6 Functional Requirements
- 7 Data Structures
- 8 Service APIs
- 9 Internal Workflows
- 10 Other Resources

Main Text:

These workloads are called cloud-native. While the first wave of these were based on virtual machines (VMs), we see a second, larger wave of these that leverage container technologies. In many cases, these containers run on top of virtual machines, thus allowing to balance good developer abstractions and fast scalability (where container technologies excel) with flexibility and isolation requirements (the strength of virtualization technology). In dedicated environments however, it can be beneficial to cut out the complexity of a virtualization layer and to run containers on bare-metal.

In all cases, users of the technology should consider the dependencies on providers of technology and infrastructure and take deliberate decisions on all components of the technology stack required to develop and run their workloads.

Diagram: Architecture of the Cloud and Container Building Block

```

    graph TD
      A[Govstack Platform BBs & Workloads] --- B[Container Clusters]
      B --- C[Virtualization Layer (IaaS)]
      C --- D[Hardware Management]
      D --- E[Commodity Server Hardware]
      F[Ops Tools: Mon, LCM, Audit, Sec] --- B
      G[IAM & Federation] --- B
      C --- H[Compute]
      C --- I[Storage]
      C --- J[Networking]
  
```

Architecture of the Cloud and Container Building Block. The Hardware and the Platform Building Blocks and Workloads are not part of this BB but were included for completeness. The architecture assumes many container clusters rather than just one for isolation reasons. Platform BBs and Workloads can directly access the IaaS/ Virtualization Layer, but most modern ones will be implemented using container technology.

Powered by GitBook



The image shows the cover of a report titled "Sovereign Cloud Stack Building Block Cloud Infrastructure (Level 2)". It features the Sovereign Cloud Stack logo and a green button labeled "Full Report".

ministerium
schaft
schutz

Protection&Control: Sustainable future of the SCS idea: Two entities, idea & brand are in the non-profit organisation

Forum SCS-Standards @ OSBA e.V.

Holds the IP rights on the **SCS brand** (and is thus unique), sets the rules for the brand usage

Charitable / Non-profit (OSBA)

Cares for and orchestrates a fair and transparent ecosystem as „neutralizer“.

Further development of **Standards** und **Certifications**, employs personell for this

Membership and usage fees from Operators and Partners (prerequisite for brand usage)

Creates visibility and trust in the market and the whole ecosystem

Collaborates with upstream communities

Partner for „certification-only partners“

Technology companies

Partner for users of the SCS **Software (Reference Implementation)**

Brand usage only possible within the limits set by Forum SCS @ OSBA e.V.

Further development, warranty, maintenance and backend support for SCS Software

Earns maintenance & support fees

Several such commercial entities exist: OSISM, sysself, dNation, Cloud&Heat, ...

Try setting up a central entity that creates a turnkey product (with coordinated policies, roadmap, maintenance, support) and orchestrates cross-stack common development needs: S7n Cloud Services GmbH



Sovereign Cloud Stack (SCS) sustainable future



Lisa Reisch
October 23, 2024

OSBA and members found the forum SCS-Standards

Berlin, 2024-10-23: Sovereign Cloud Stack (SCS) provides all cloud-technological foundations to realize digital sovereignty and open source strategies and gives users control over their data. The research project, funded by the German Ministry for Economic Affairs and Climate Action and carried out by the Open Source Business Alliance (OSBA), will be concluded as planned on 2024-12-31. The OSBA and 14 member companies have taken care to ensure a sustainable future for the key results and to further advance the SCS standards.

Sovereign Cloud Stack, funded with roughly 13.2 million Euros, will continue to receive professional development and be available for the cloud market after the project phase. The OSBA and 14 of its member companies are founding the forum SCS-standards effective 2025-01-01. This consortium inside the OSBA takes responsibility for the standards and certifications and their further evolution in the future. This also ensures the quality assurance in a sustainable manner. All users of Sovereign Cloud Stack and the whole ecosystem around SCS can thus have assurance of relying on a future-proof cloud technology.

“SCS embodies quality, transparency and interoperability in the IT industry. The core topics of standardization and certification are continued in the newly founding forum SCS-Standards to protect these values.” explains Peter Ganten, chairman of the OSBA.

14 strong partners engage

“SCS needs to be advanced even without public subsidies. If we manage to improve the market conditions and create offerings from various cloud service providers that are interoperable and federatable thanks to common standards, this will have beneficial effects on the German and European cloud economy overall and will lead to long-term success. This is the reason for our members to invest time and money.” comments Marius Feldmann, COO of Cloud&Heat, chairman of ALASCA e.V. and one of the two interim chairs of the forum.

Up to now, 14 companies have collected an annual budget of 257,000 Euros. Their engagement goes beyond the financial support: They are supporting the SCS ideas and the common standards. The founding members thus far are (in alphabetical order):

- artcodix GmbH
- B1-Systems GmbH





SCS Questions?



<https://scs.community/>

<https://docs.scs.community/>

<https://github.com/SovereignCloudStack/>