

FOSSGIS 2024 Hamburg
20. März 2024

Manuela Urban


Sovereign Cloud Stack: Offene, förderierbare Cloud-Technologie für jeden Sektor

Der Traum von der Wolke...



Quelle: Bundesministerium für Wirtschaft und Technologie 2010

...und die Realität

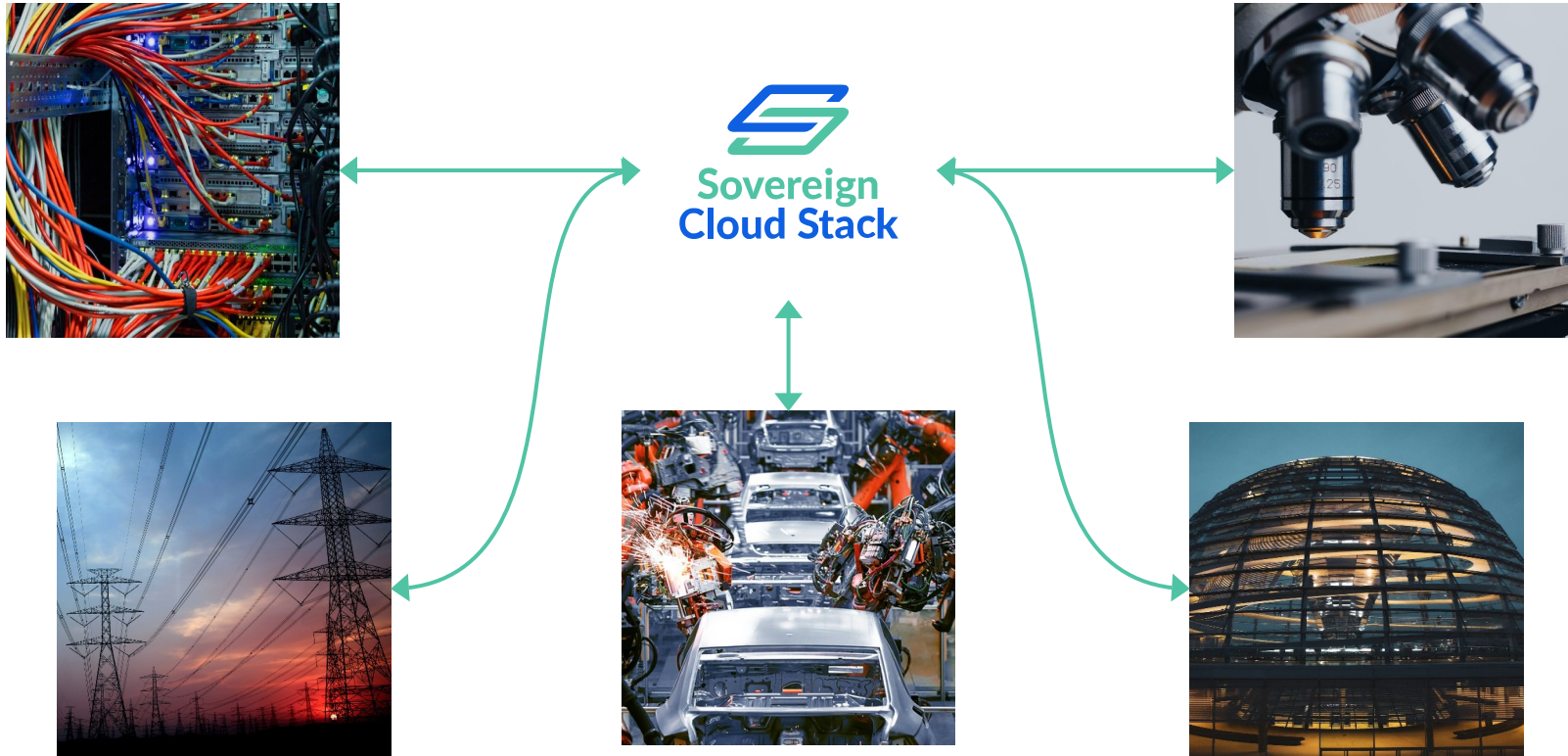
- Über 80 % der Unternehmen in Europa fühlen sich technologisch abhängig.¹
- Amazon, Microsoft, Alphabet (Google) beherrschen den Markt.²
- Vendor lock-in³
- Inkompabilität bei Infrastrukturen, Plattformen und Applikationen
- US Foreign Intelligence Surveillance Act (FISA)  EU DSGVO
- Dynamische, verteilte Plattformen sind hochkomplex im Betrieb.
- Fachkräftemangel

1 ZEW – Leibniz-Zentrum für Europäische Wirtschaftsforschung: „Schwerpunktstudie Digitale Souveränität 2021“ Hrsg.: Bundesministerium für Wirtschaft und Energie (Oktober 2021)

2 <https://www.srgresearch.com/articles/huge-cloud-market-is-still-growing-at-34-per-year-amazon-microsoft-and-google-now-account-for-65-of-all-cloud-revenues>

3 https://www.cio.bund.de/SharedDocs/downloads/Webs/CIO/DE/digitale-loesungen/marktanalyse-reduzierung-abhaengigkeit-software-anbieter.pdf?__blob=publicationFile&v=1

Sovereign Cloud Stack: Ein Ökosystem für offene Infrastruktur



SCS Leistungen



1

Zertifizierbare Standards



2

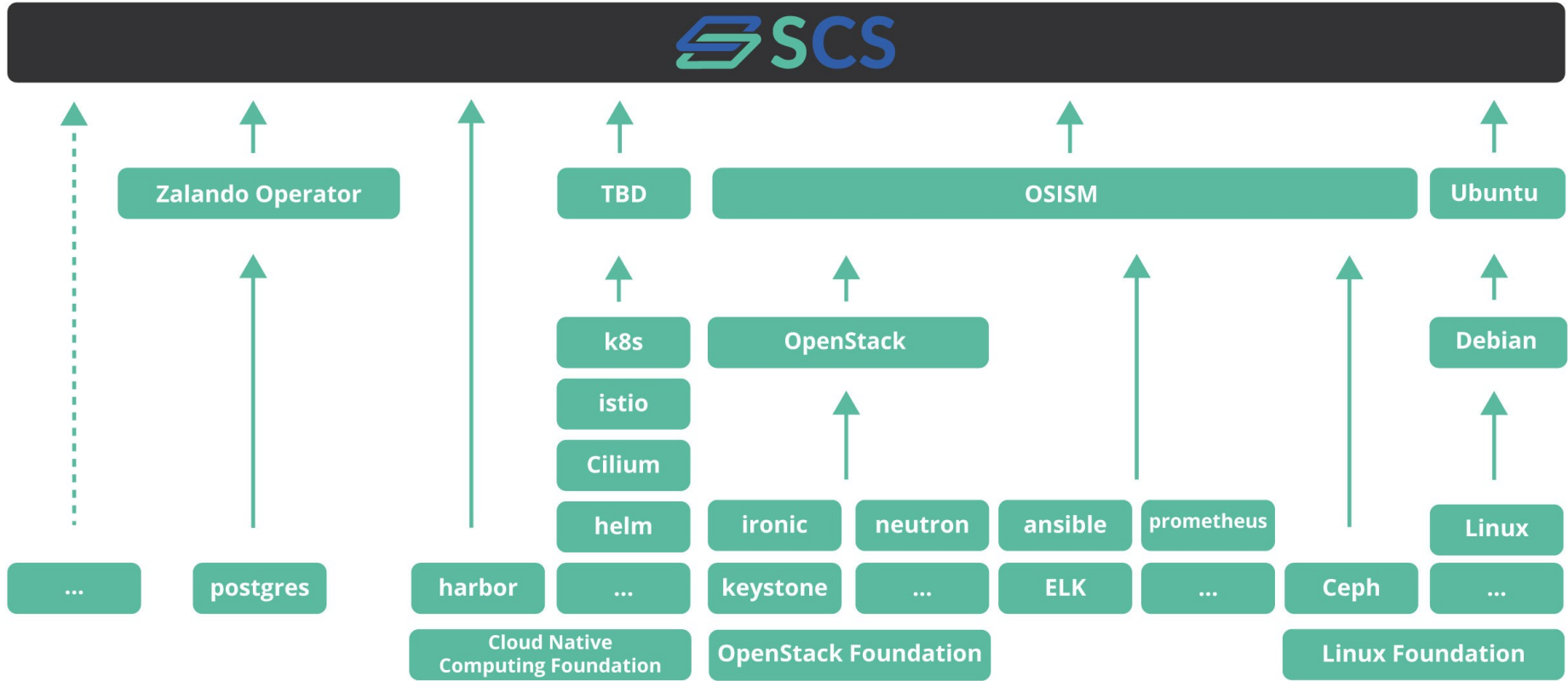
Modulare OS-Referenz-
Implementierung



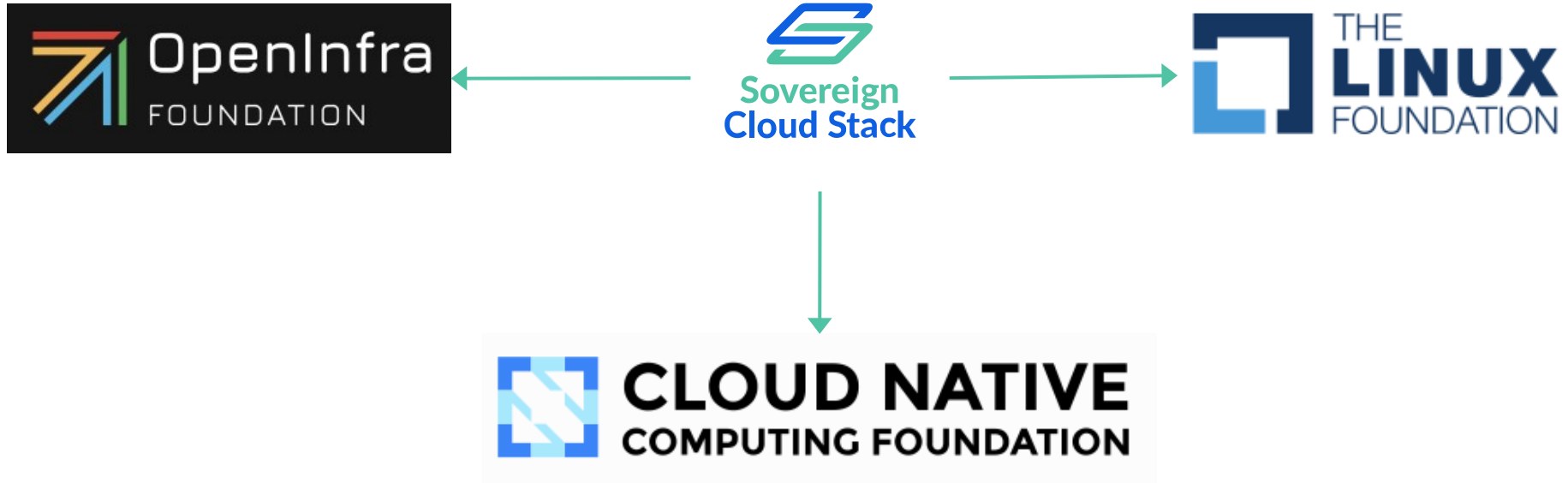
3

Open Knowledge

SCS integriert und ergänzt bewährt Open-Source-Bausteine



Upstream first!



Offene, zertifizierbare Standards

- ✓ Interoperabilität
- ✓ Portabilität
- ✓ Skalierung
- ✓ einfachere Zusammenarbeit von CSPs, Technology Providers, Service Companies, Software Vendors
- ✓ SaaS-Anbieter können plattformunabhängige Dienste entwickeln und anbieten

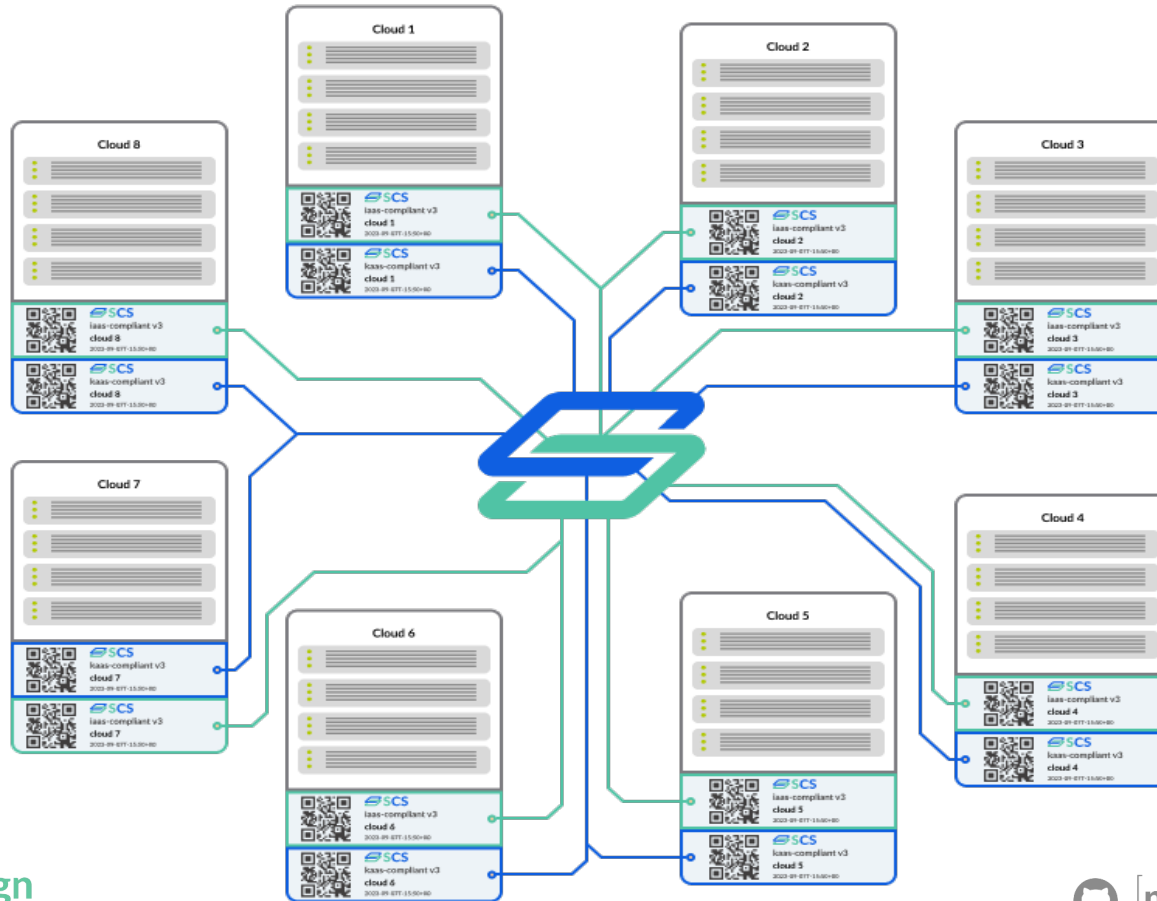
PR Title	Description	Time
scs-0001-v1-sovereign-cloud-standards.md	Extend scs-0003: more context and process (resolves issues/#...	2 months ago
scs-0002-v1-standards-docs-org.md	Add markdown linter and link validator (#254)	8 months ago
scs-0002-v2-standards-docs-org.md	Fix/move scs 0002 to standards (#333)	3 months ago
scs-0003-v1-sovereign-cloud-standards-yaml...	Added classification field to the check tool descriptor (#365)	3 hours ago
scs-0100-v1-flavor-naming.md	Relocated flavor-naming.md to the proper position (#315)	5 months ago
scs-0100-v2-flavor-naming.md	Relocated flavor-naming.md to the proper position (#315)	5 months ago
scs-0100-v3-flavor-naming.md	Decouple standard flavors from flavor naming (#319)	2 months ago
scs-0101-v1-entropy.md	Revision of scs-0101-v1-entropy (#297)	5 months ago
scs-0102-v1-imaee-metadata.md	Update scs-0102-v1-imaee-metadata.md (#368)	last week

SCS compatible clouds

This is a list of clouds that we test on a nightly basis against our [scs-compatible](#) certification level.

Name	Description	Operator	IaaS Compliance Check	HealthMon
gx-scs	Dev environment provided for SCS & GAIA-X context	plusserver GmbH	compliant passing	HM
pluscloud open - prod1	Public cloud for customers	plusserver GmbH	compliant passing	HM
pluscloud open - prod2	Public cloud for customers	plusserver GmbH	compliant passing	HM
Wavestack	Public cloud for customers	noris network AG/Wavecon GmbH	compliant passing	HM
REGIO.cloud	Public cloud for customers	OSISM GmbH	compliant passing	Dashboard

Sovereign Cloud Grid: Build a virtual hyperscaler!



Open Knowledge



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 5. 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](#)

Architectural Layers

Ops Layer

Tooling and infrastructure design for easy, efficient and transparent ways to operate an SCS Cloud.

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.



OPEN OPERATIONS MANIFESTO

Building a community of practice and transparency for operations

<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.

Cloud-Angebote auf Basis von SCS





BayernCloud Schule

Die Plattform für eine moderne digitale Bildung

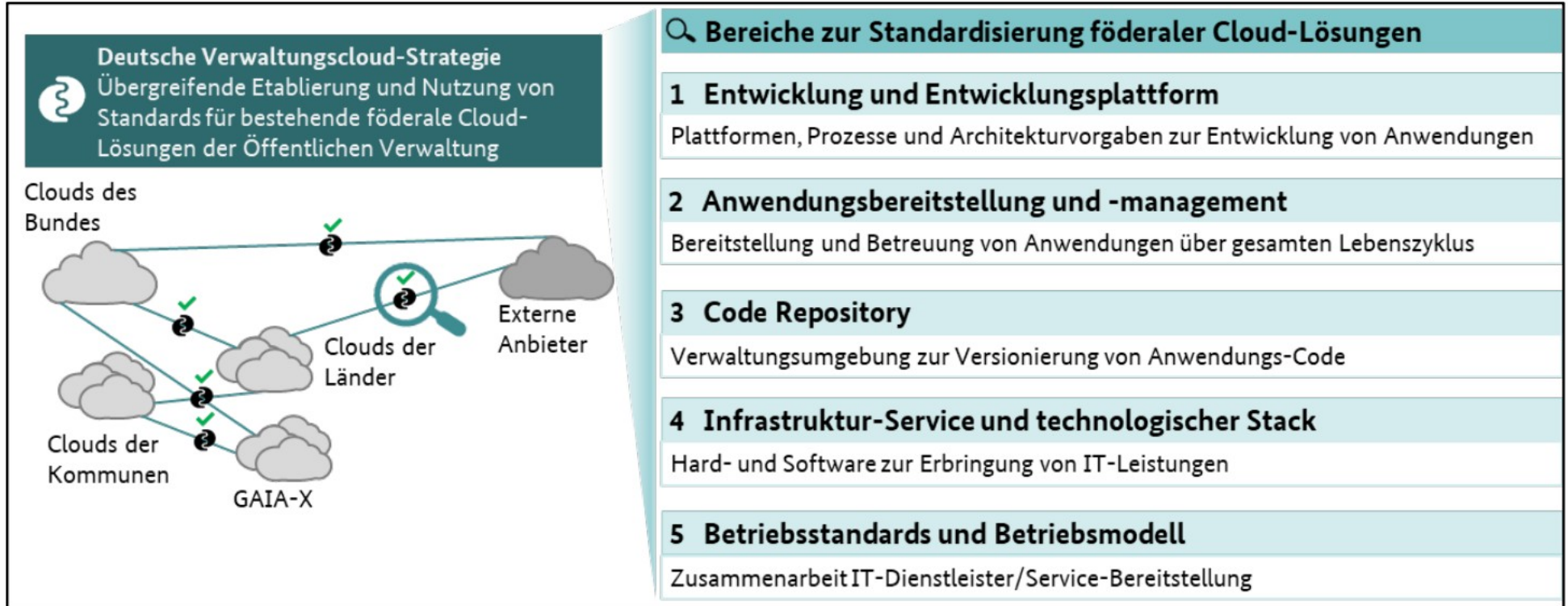
→ Informationen für Schulleitungen zur Freischaltung



...läuft auf SCS-Infrastruktur.

powered by **plusserver**

SCS ist an der Entwicklung der Deutschen Verwaltungscloud (DVC) beteiligt.



SCS in



Below you will find all the groups that are public.
You can easily contribute to them by requesting to join these groups.

> **S** **Smarte.Land.Regionen**

S **SopraSteria**

Sovereign Cloud Stack Owner

Eine Plattform — standardisiert, entwickelt und betrieben von Vielen.
Sovereign Cloud Stack (SCS) ist ein vom BMWK gefördertes Projekt der OSB Alliance e.V.
SCS stellt Standards, Software und Wissen für Cloudinfra bereit. <https://scs.community/>

S **Stadt Detmold**

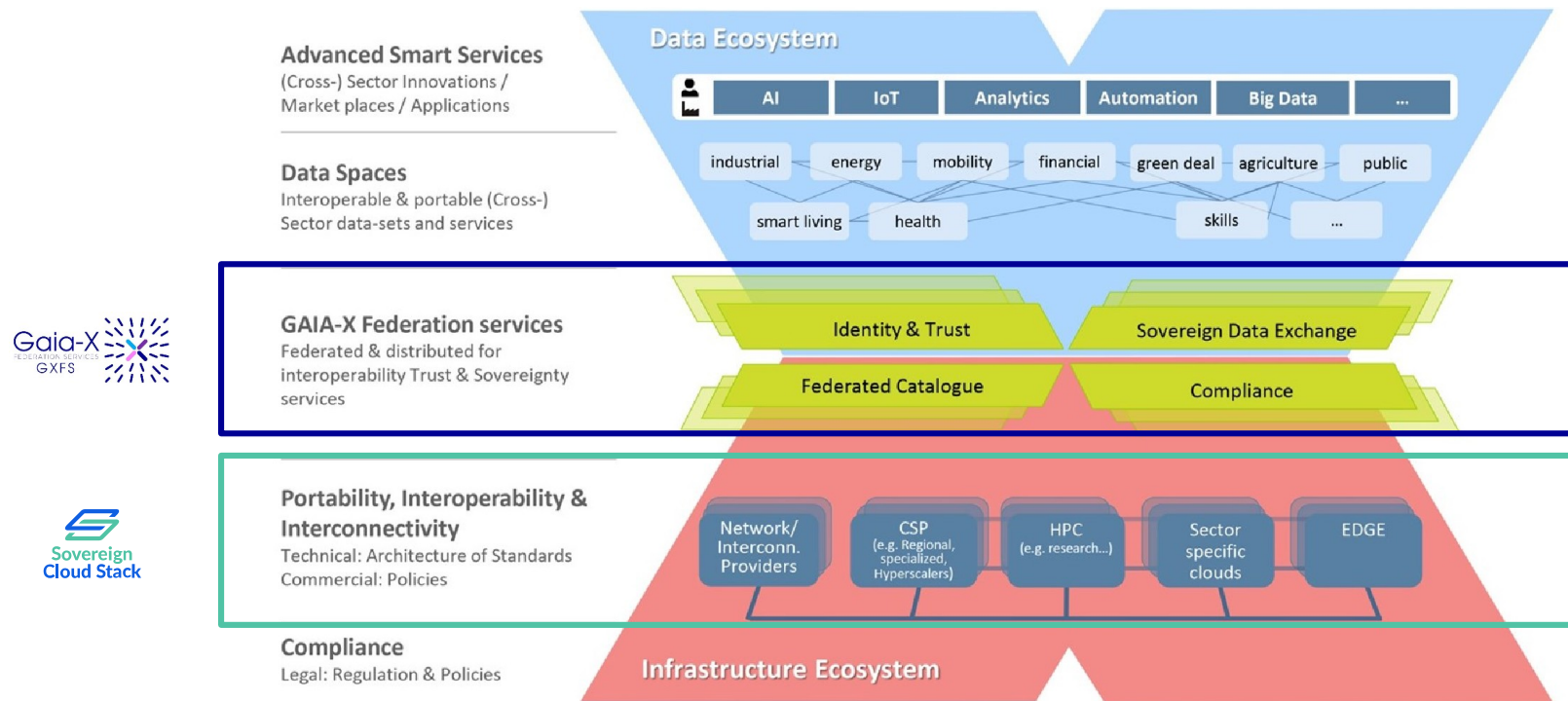
> **Stadt Soest**

Stadt Wolfsburg
This is the official group of the city of Wolfsburg, Germany. Here you can find the open source projects that the city is working on or supporting.

T **Testgruppe**

T **Thüringer Landesverwaltung**

SCS liefert Infrastrukturschicht für Gaia-X Federation Services



SCS beteiligt sich an GovStack

GovStack harnesses the power of a global network and is led by:



digital
impact
alliance



About ▾

Our Offerings ▾

Global Showcase

News & Events

Participate ▾



GovSpecs

We work with governments to identify real-life scenarios for digital...

[Learn more](#)



GovTest

We provide an open demonstration environment for...

[Learn more](#)



GovLearn

We collaborate to provide capacity building, trainings, and support designing...

[Learn more](#)



GovExchange

We offer a platform to research the market of digital services and find...

[Learn more](#)

SCS unterstützende Organisationen

23|Technologies

aov^o

artcodix

B1
SYSTEMS

SPRIN-D

Bundesministerium
für Wirtschaft
und Klimaschutz

cleura

CLOUD
& HEAT

{C} CLOUDICAL

DAITEAP
CLOUD SOLUTIONS

dataport

_dilossacon

dNation
DevOps Nation

GONICUS
PIONEERS OF OPEN SOURCE

gridscale

JH-COMPUTERS
perfect cloud IT

LEITWERK
Die Zukunft Ihrer IT

noris network

Open
Infrastructure
FOUNDATION

OSB Open Source
Business
ALLIANCE
Bundesverband für digitale Souveränität e.V.

T . . .

OX Stay Open.

OSISM

OVHcloud

plusserver

PROVENTA

ScaleUp
Technologies

Stackable

StackHPC

stackXperts

Syself

univention
be open

WAVECON

gaia-x

SCS Summit 2024

Berlin, May 14th

<https://scs.community/de/summit2024/>



— An OSB ALLIANCE project —



<https://scs.community>

Supported by:



on the basis of a decision
by the German Bundestag



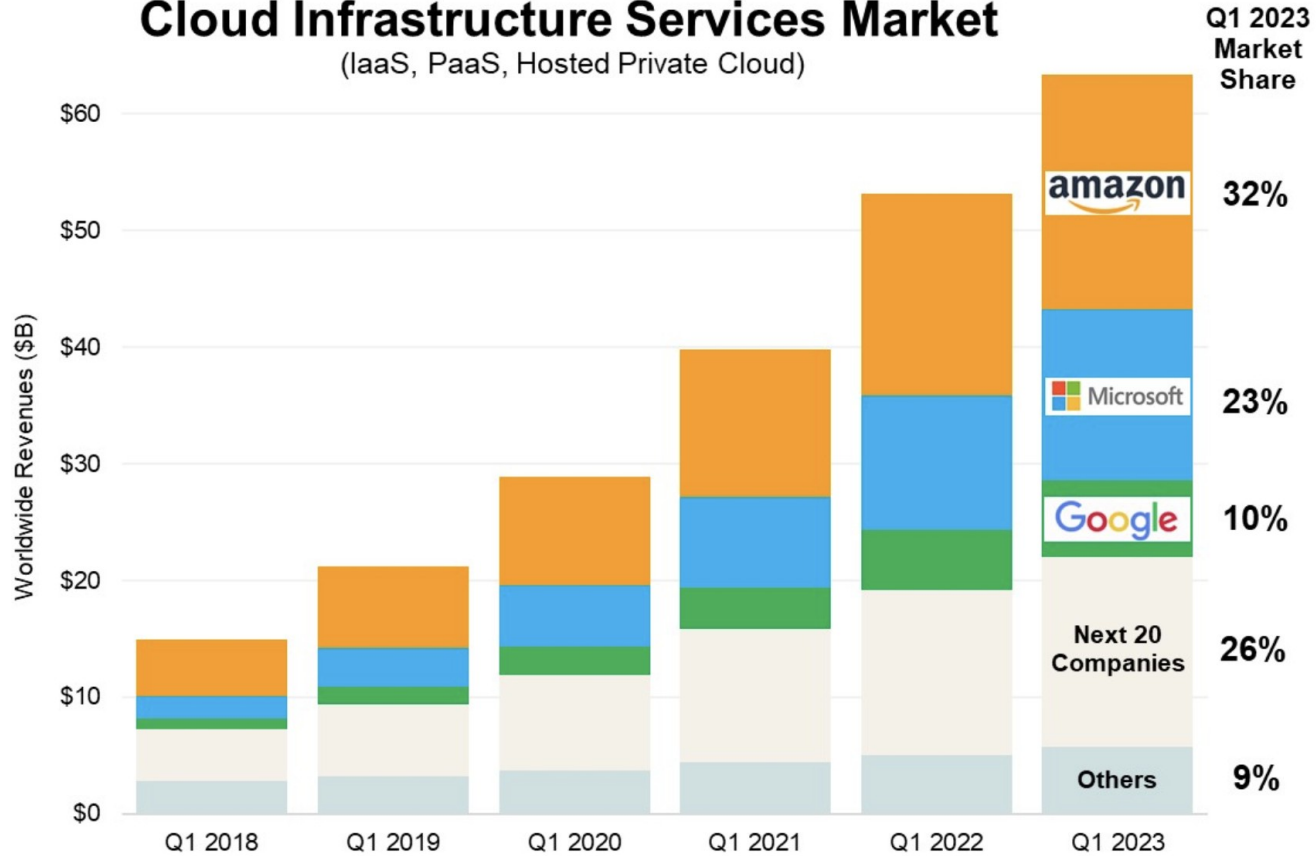
<https://scs.community>
<https://github.com/SovereignCloudStack>
<https://gitlab.opencode.de/sovereigncloudstack>
[#scs-community:matrix.org](https://matrix.org/#scs-community)
scs@osb-alliance.com

One platform – standardised, built and operated by many.

Supplement

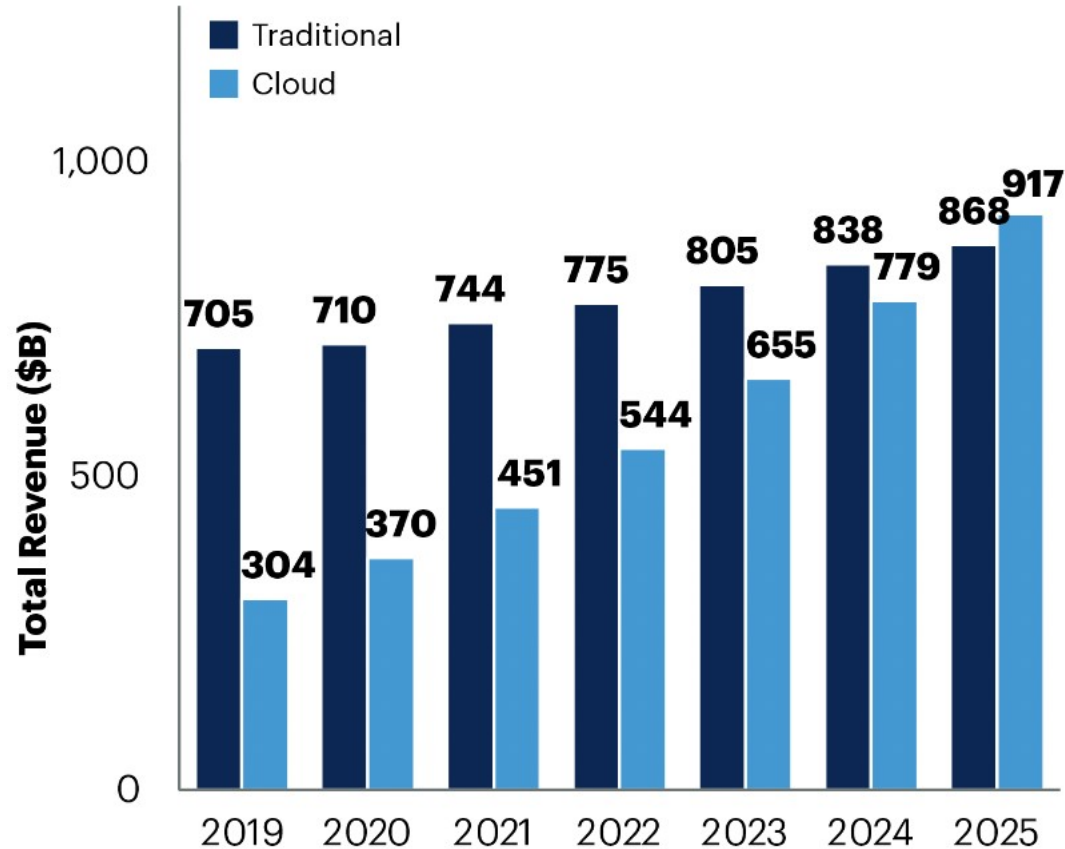
Cloud Infrastructure Services Market

(IaaS, PaaS, Hosted Private Cloud)



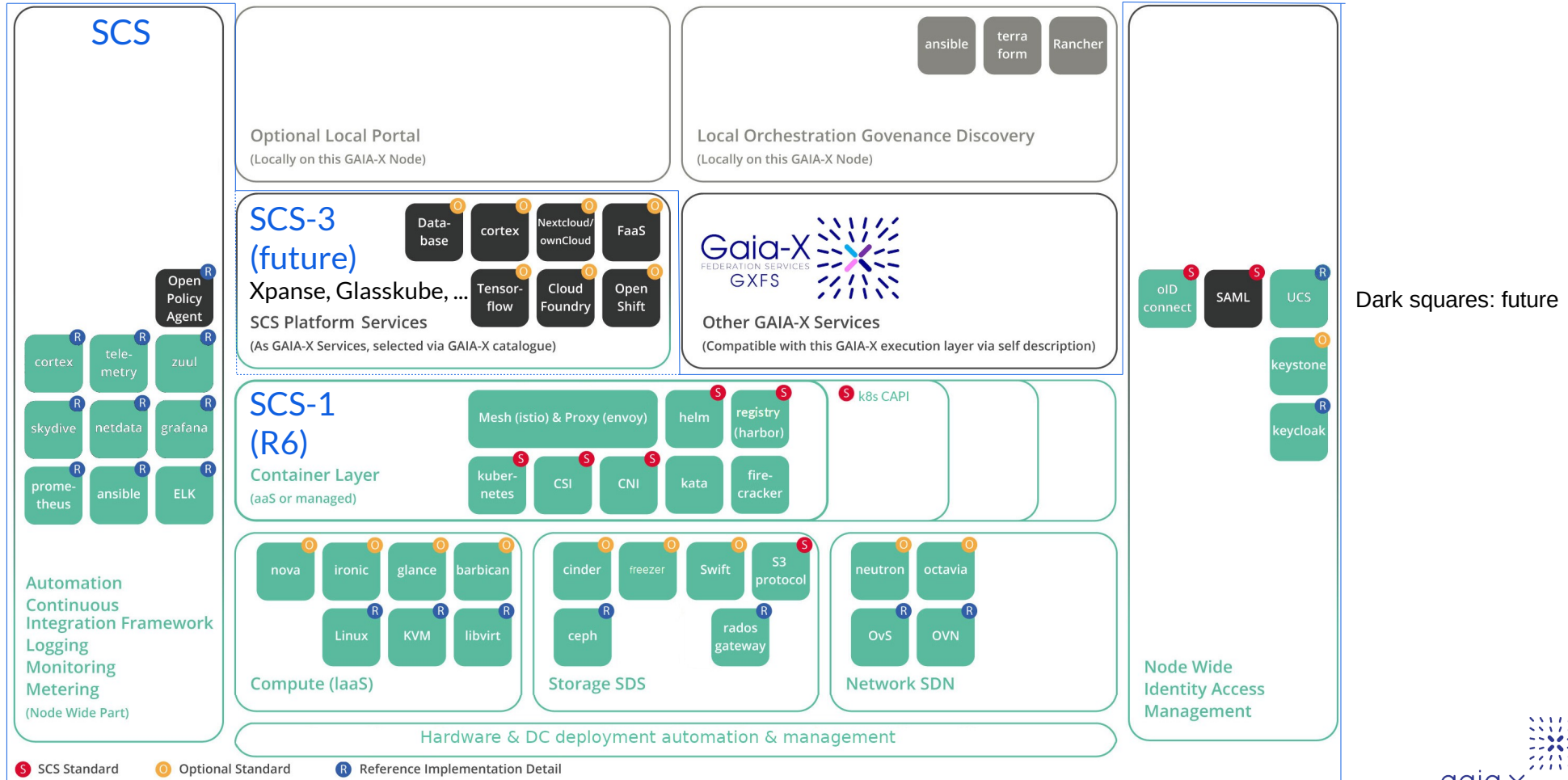
Source: Synergy Research Group

"Cloud-Shift": Enterprise IT Spending Worldwide

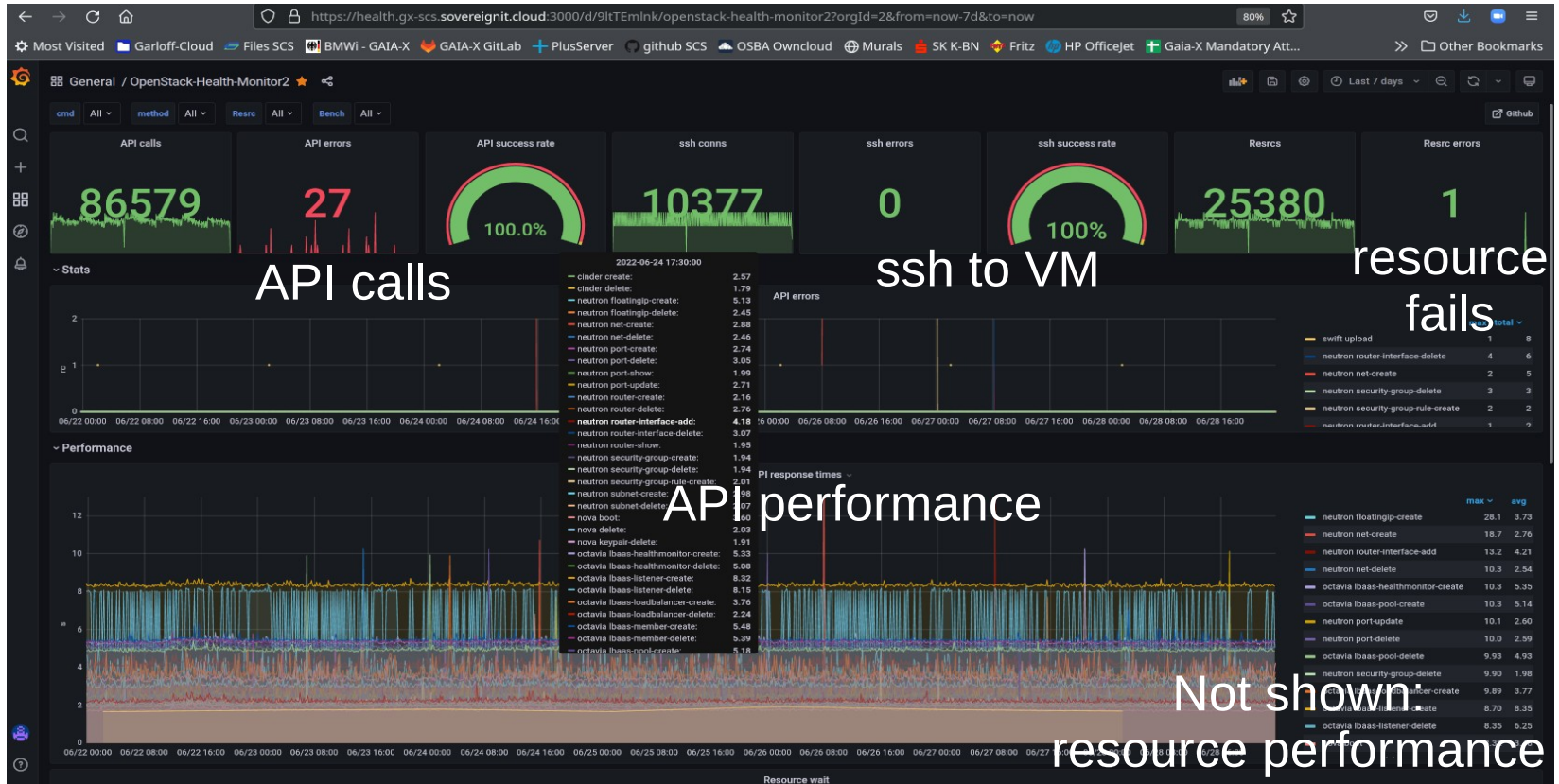


Source: [Gartner 2022](#)

SCS Reference Architecture (current status)



SCS Operations: Measure what you want to manage.



Operations: SCS Tooling

The ARA interface displays a table of job execution results. The table has columns for Status, Report, Date, Duration, Hosts, Tasks, Results, Ansible, Controller, Name (or path), and CLI. The 'Results' column shows the number of successful, failed, and skipped tasks. The 'Controller' column lists the Ansible controller used for each job. The 'Name (or path)' column shows the path to the Ansible playbook.

Status	Report	Date	Duration	Hosts	Tasks	Results	Ansible	Controller	Name (or path)	CLI	Labels
Success	17 Aug 2021 12:15:02 +0000	00:00:18.31	4	3	12	2,10.13	manager_osism-ansible_1.manager_default	/ansible/generic-facts.yml	remote_user:dragon [check:False] [tags=all]		
Success	17 Aug 2021 11:28:41 +0000	00:01:38.74	4	27	86	2,10.12	manager_kolla-ansible_1.manager_default	/ansible/kolla-prometheus.yml	remote_user:dragon [check:False] [tags=all]		
Success	17 Aug 2021 11:27:34 +0000	00:01:06.06	4	18	69	2,10.13	manager_osism-ansible_1.manager_default	/ansible/monitoring-netdata.yml	remote_user:dragon [check:False] [tags=all]		
Success	17 Aug 2021 11:27:04 +0000	00:00:28.34	1	11	11	2,10.13	manager_osism-ansible_1.manager_default	/ansible/monitoring-openstack-health-monitor.yml	remote_user:dragon [check:False] [tags=all]		
Success	17 Aug 2021 11:26:50 +0000	00:00:12.83	1	4	4	2,10.13	manager_osism-ansible_1.manager_default	~/openstack/playbook-bootstrap-ceph-rgw.yml	remote_user:dragon [check:False] [tags=all]		
Failure	17 Aug 2021 11:26:36 +0000	00:00:11.76	2	5	5	2,10.13	manager_osism-ansible_1.manager_default	~/openstack/playbook-bootstrap-basic.yml	remote_user:dragon [check:False] [tags=all]		
Success	17 Aug 2021 11:24:03 +0000	00:02:31.58	4	34	82	2,10.12	manager_kolla-ansible_1.manager_default	/ansible/kolla-designate.yml	remote_user:dragon [check:False] [tags=all]		

The Keycloak Administration Console dashboard provides a central management interface for the Keycloak server. It includes links to the Administration Console, Documentation, Keycloak Project, Mailing List, and Report an issue. The Administration Console is described as a tool to centrally manage all aspects of the Keycloak server.

The Kibana Index Patterns page shows the 'Create index pattern' step. It prompts the user to define an index pattern that matches a single source or multiple data sources. The 'Index pattern name' field is currently empty, and the 'Next step' button is visible.

The Netbox Device Roles configuration page displays a table of device roles. The table has columns for Name, Devices, VMs, Color, VM Role, and Description. The roles listed include Ceph control node, Ceph resource node, Compute node, Control node, Generic node, Manager node, Monitoring node, and Network node. The 'Color' column shows a color swatch for each role, and the 'VM Role' column shows a checkmark indicating if the role is a VM role.

Name	Devices	VMs	Color	VM Role	Description
Ceph control node	0	0	Orange	✓	—
Ceph resource node	0	0	Orange	✓	—
Compute node	0	0	Blue	✓	—
Control node	0	0	Blue	✓	—
Generic node	0	0	Black	✓	—
Manager node	0	0	Green	✓	—
Monitoring node	0	0	Green	✓	—
Network node	0	0	Blue	✓	—

Kibana

Netbox

SCS Open Development in Practice

< >
today edit
18 – 22 Sep 2023

day week month

	Mon 18/09	Tue 19/09	Wed 20/09	Thu 21/09	Fri 22/09
all-day					
09				09:05 - 9:55 GMT+2 Team OPS Sprint Review/Planning and Refinement	
9:30					
10			10:05 - 10:55 GMT+2 Team IaaS Sprint Review/Planning and Refinement		10:05 - 10:55 GMT+2 IAM Hacking session
10:30				10:35 - 11:25 GMT+2 Team Container Sprint Review/Planning and Refinement	
11	11:05 - 11:55 GMT+2 SIG Documentation				
11:30			11:35 - 12:25 GMT+2 Team IAM Sprint Review/Planning and Refinement		
12					
12:30					
13					
13:30					
14	14:05 - 14:55 GMT+2 SCS Product Board			14:05 - 14:55 GMT+2 SIG Standardization/Certification	
14:30					
15	15:05 - 15:55 GMT+2 Blocker: SCS Team Overflow/Replacement	15:05 - 15:55 GMT+2 Lean SCS Operator Coffee		15:05 - 15:45 GMT+2 Weekly SCS Community Meeting	
15:30					

SCS: Realize Digital Sovereignty



Competence (esp. Operations)

Ability to shape technology

Choice / Switching / Interoperability

Legal Compliance (GDPR ...)



<https://rdcu.be/cWdBJ>

SCS Certification

Levels of digital sovereignty

4: Operational transparency and knowledge and skills available

3: Transparent technology and capability to contribute & shape

2: Freedom of choice (many providers as well as on-prem) , Interoperability, Portability

1: Legal compliance



SCS certification levels



3: “**SCS-Sovereign**” – Ops/IAM Stacks “open” as well, transparency on monitoring, incidents, contributing to “Open Operations”
(5x Open)

2: “**SCS-Open**” – SBOM for functional stack available, fully “open”
(4x Open according OpenInfra Foundation)

1: “**SCS-Compatible**” – Technical compatibility, interoperabel (Conformance tests pass: CNCF, OIF, SCS)

0: ENISA / Gaia-X labels / GDPR (no SCS certificate)

Security by Design

Using strong isolation for container clusters

- Different tenants receive their own Kubernetes clusters; by default, no cluster sharing happens
- Underlying VMs, network, storage are separated by strong virtualization barriers

Private registry for users

- Make it easy for DevOps teams to enforce their own security vetting processes and control their supply chain
- Vulnerability scanning included in registry solution

Daily patching supported

- The architecture is built for daily patching (or redeployment) without noticeable customer impact
- This creates a practice of keeping the systems up to date especially with respect to security patches

Secure Operational practices

- Document updating, patching, security response, ... processes to help with secure operations

Air gap mode supported

- Deploying and updating without internet connection possible
- Leveraging an internal registry and patch distribution mechanism (includes vulnerability scanning)

Certification

- Budget for security certifications (BSI) with partners – SCS based PlusCloud Open achieved BSI C5 in Nov 2021
- Pen testing planned (and budget allocated)

Supply chain security

- Work with community on further improving supply chain security (reproducible builds, scanning, ...)

Confidential computing

- Work with intel (and AMD) on TDX / SVE enablement for additional protection



SCS Open Source Health Check

<https://github.com/SovereignCloudStack/Docs/blob/main/Design-Docs/OSS-Health.md>

1. Really Open: Four Opens (Code, Development, Design, Community)
2. Maturity: Quality, Reviews, CI, Maintenance, Standards
3. Security: Supply Chain, Sec Response, Sec Testing / Pen Test
4. Activity: Adoption, Community, Ecosystem
5. Risk Assessment: Likelihood to fail? Replace? Fork?

SCS: How to start

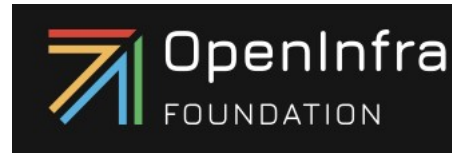
1. Use existing SCS public cloud IaaS offerings:
 - OSISM's betacloud, PlusServer's pluscloudopen, Wavecon/Noris' wavestack, regio.digital
 - a) Running SCS ref.impl. for k8s aaS (KaaS) on top of it
 - b) Using managed SCS ref.impl. for KaaS (using e.g. sysself, see GXFS)
 - c) Using Gardener based managed k8s (PSKE, ...)
2. Use Cloud-in-a-Box (128GB RAM box for 3.5k€)
3. Deploy SCS testbed on top of pre-existing OpenStack IaaS.
(Deploy SCS on a notebook in a camper van as Robert Holling @ HS Osnabrück did.)
4. Build small PoC env (min. 5 hardware nodes: 4*HCI+1*Manager)
5. Production env. ~12 -- 300 nodes

The Four Opens

1. Open Source
2. Open Design
3. Open Development
4. Open Community

A fifth Open?

5. Open Operations



Zur Bedeutung von Open Source

EU-Studie: Open Source stärkt die Wirtschaft und die technologische Unabhängigkeit

FEATURED | VERBANDS-NEWS | 13. DEZEMBER 2021



<https://digital-strategy.ec.europa.eu/en/library/study-about-impact-open-source-software-and-hardware-technological-independence-competitiveness-and>

<https://www.acatech.de/publikation/open-source-i40-innovationstreiber/>



<https://scs.community>

Generiert aus:



aufgrund eines Beschlusses
des Deutschen Bundestages

SCS: Why thoroughly Open?

- Highly innovative
- Best possible quality
- Efficiency and reduced complexity
- Trust through transparency
- Digital sovereignty
- We believe that basic cloud technology and know-how should be common property.

