



<https://scs.community>

Supported by:



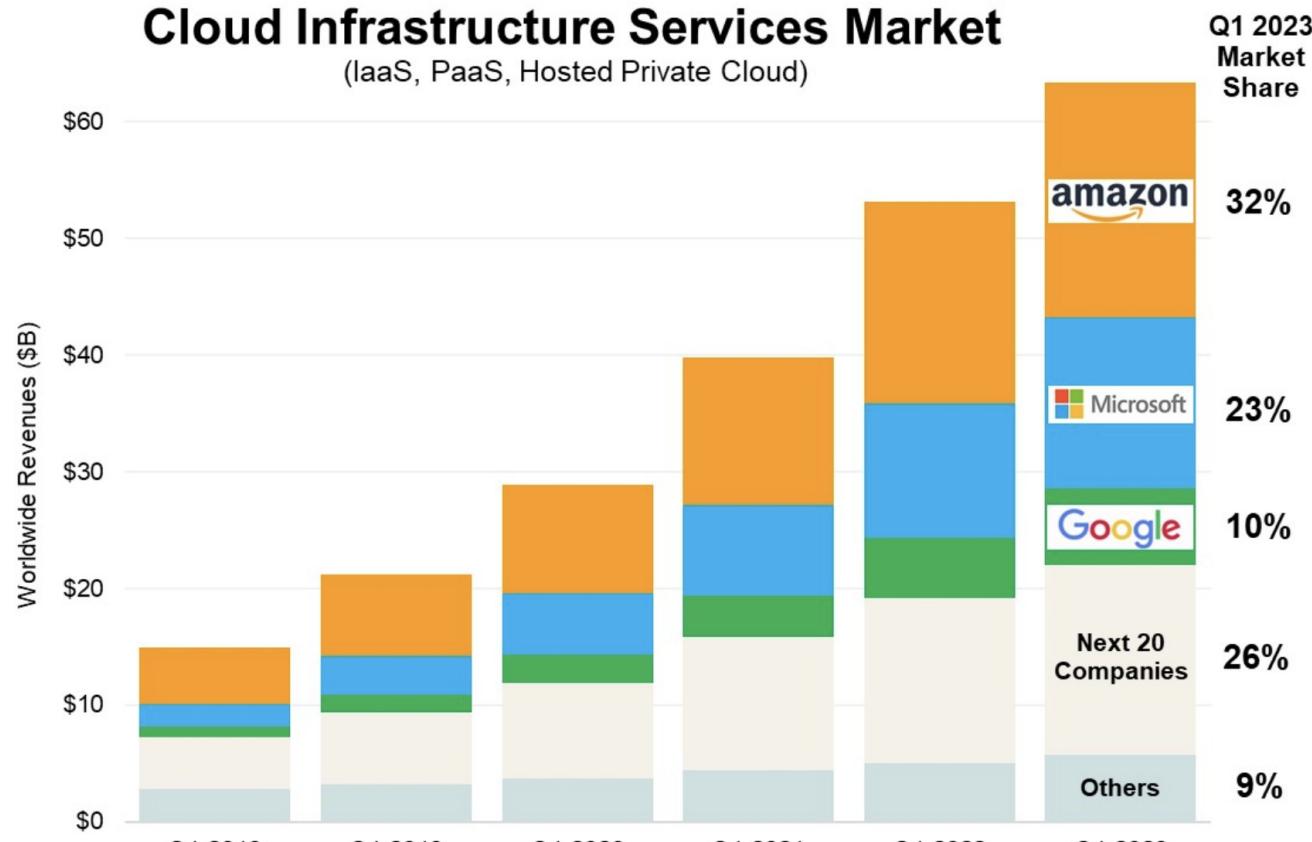
on the basis of a decision
by the German Bundestag

gaia-x

C4DT Conference on Trustworthy and Sovereign Cloud Computing
September 13th, 2023

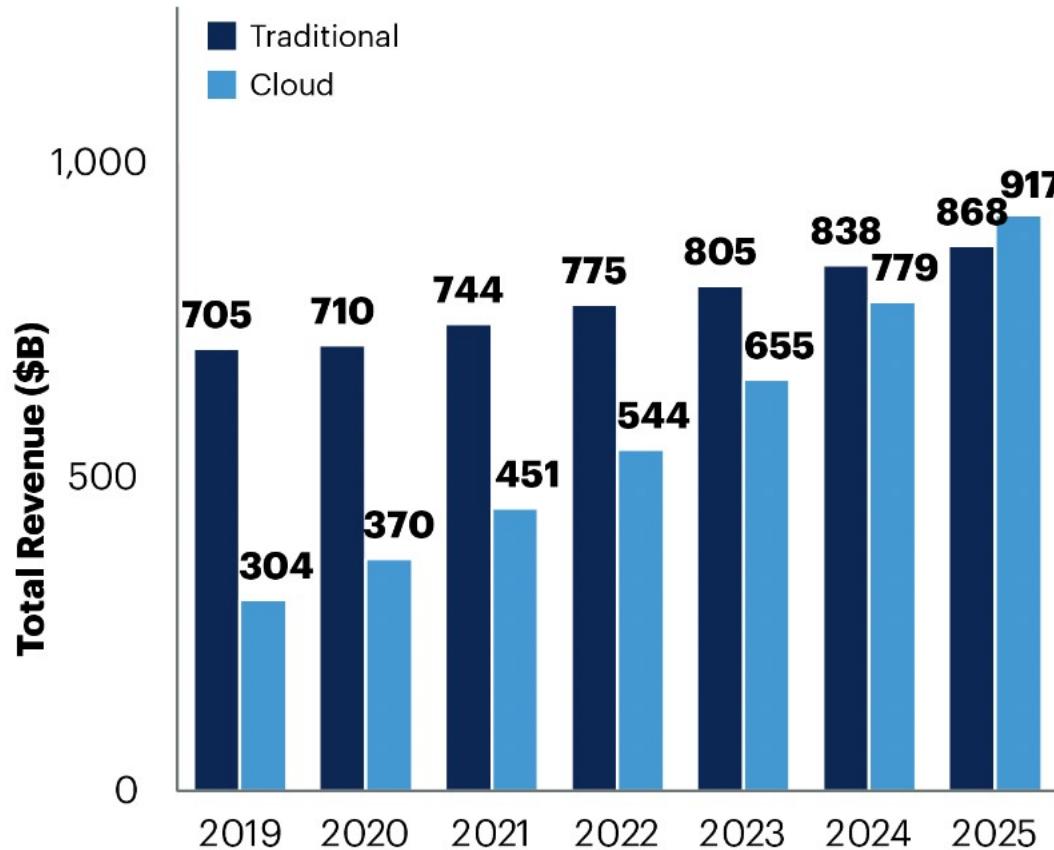
Dr. Manuela Urban

Sovereign Cloud Stack: Open Source and Open Operations Solutions



Source: Synergy Research Group

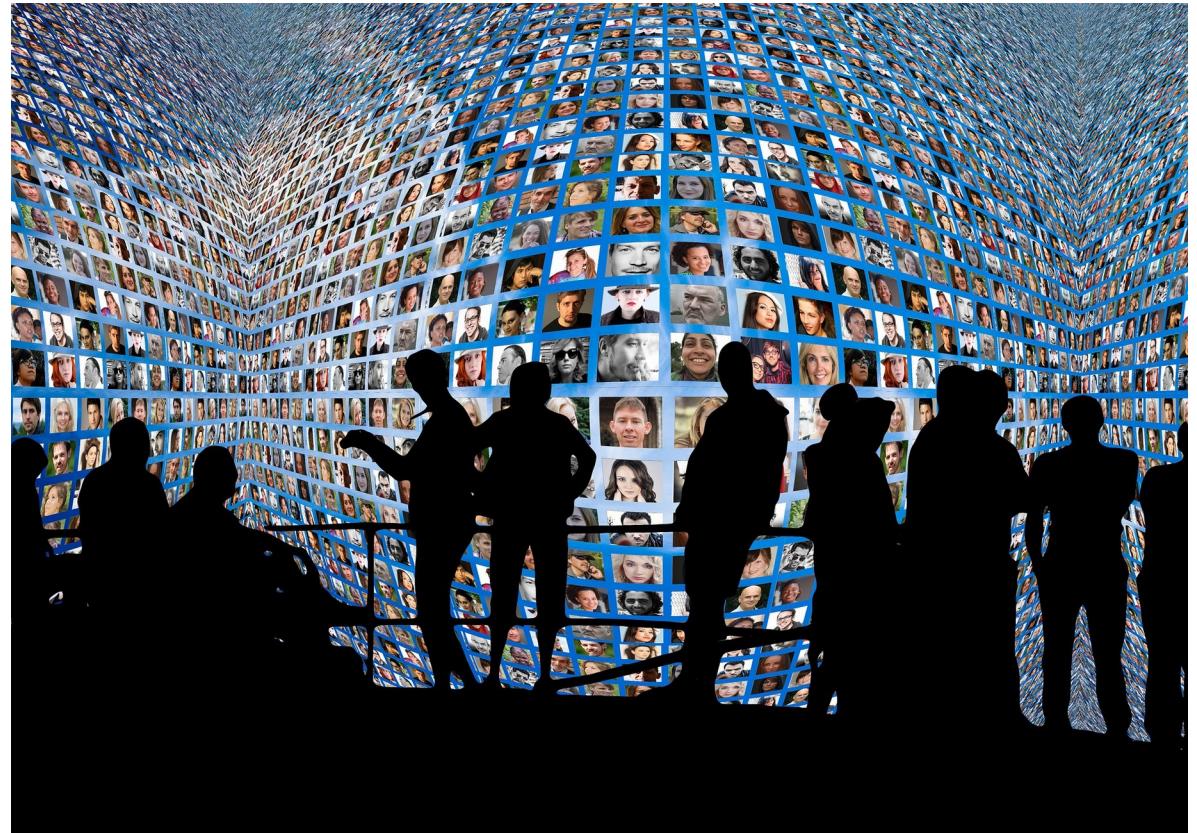
"Cloud-Shift": Enterprise IT Spending Worldwide



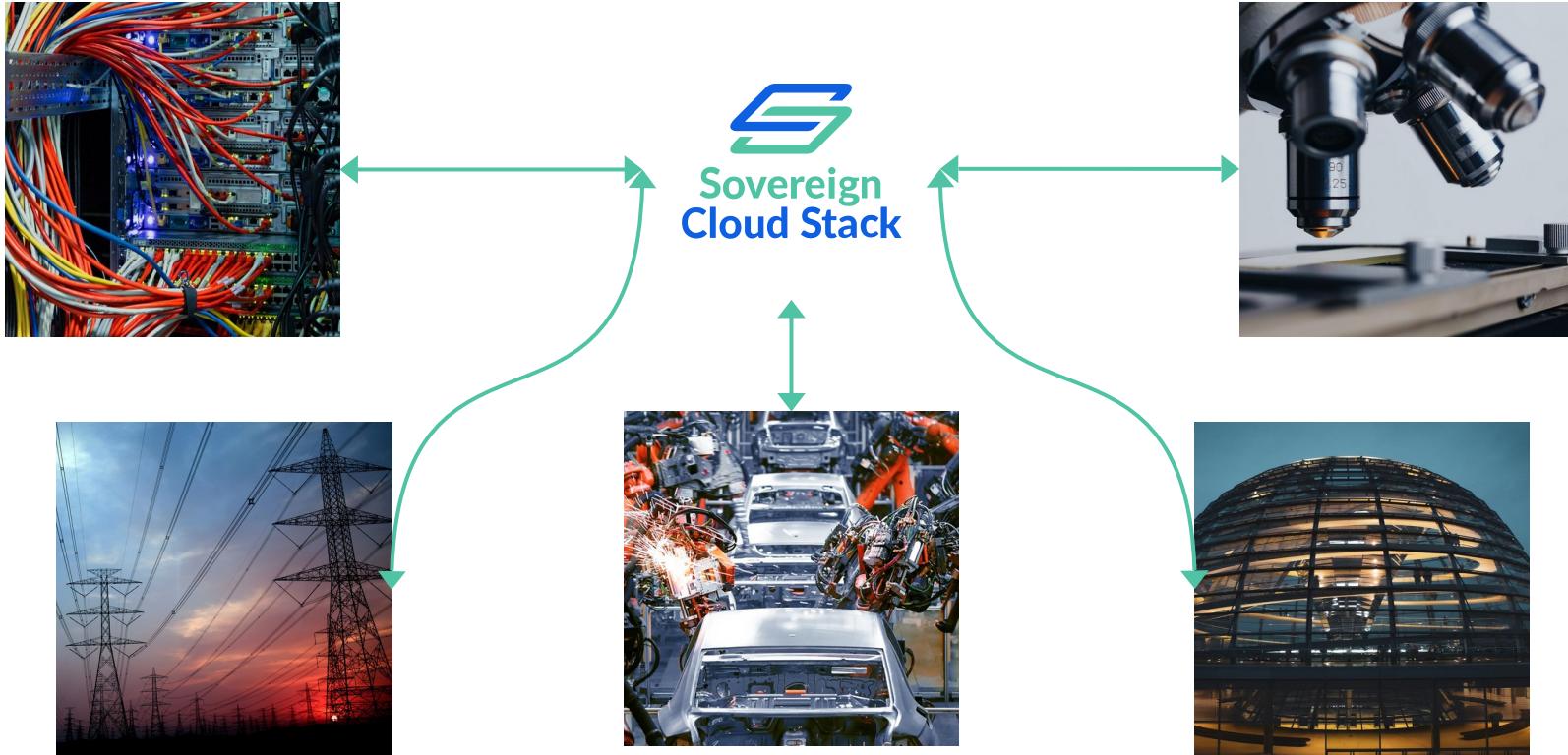
Source: Gartner 2022

Sovereign Cloud Stack

...is an open community
that builds **standardised**
Open Source cloud
technology
and shares **operational**
knowledge.



Sovereign Cloud Stack Mission: Open Source Cloud Technology Toolbox and a Community of Practice for all Sectors



SCS Supporting Organisations

23|Technologies



SPRIN-D



cleura C



[C] CLOUDICAL



dilossacon



GONICUS
PIONEERS OF OPEN SOURCE



LEITWERK
Die Zukunft Ihrer IT

noris network



OX Stay Open.



plusserver

Stackable

StackHPC

Syself

univention
be open

WAVECON



<https://scs.community>



Sovereign Cloud Stack Deliverables



1

Certifiable Standards



2

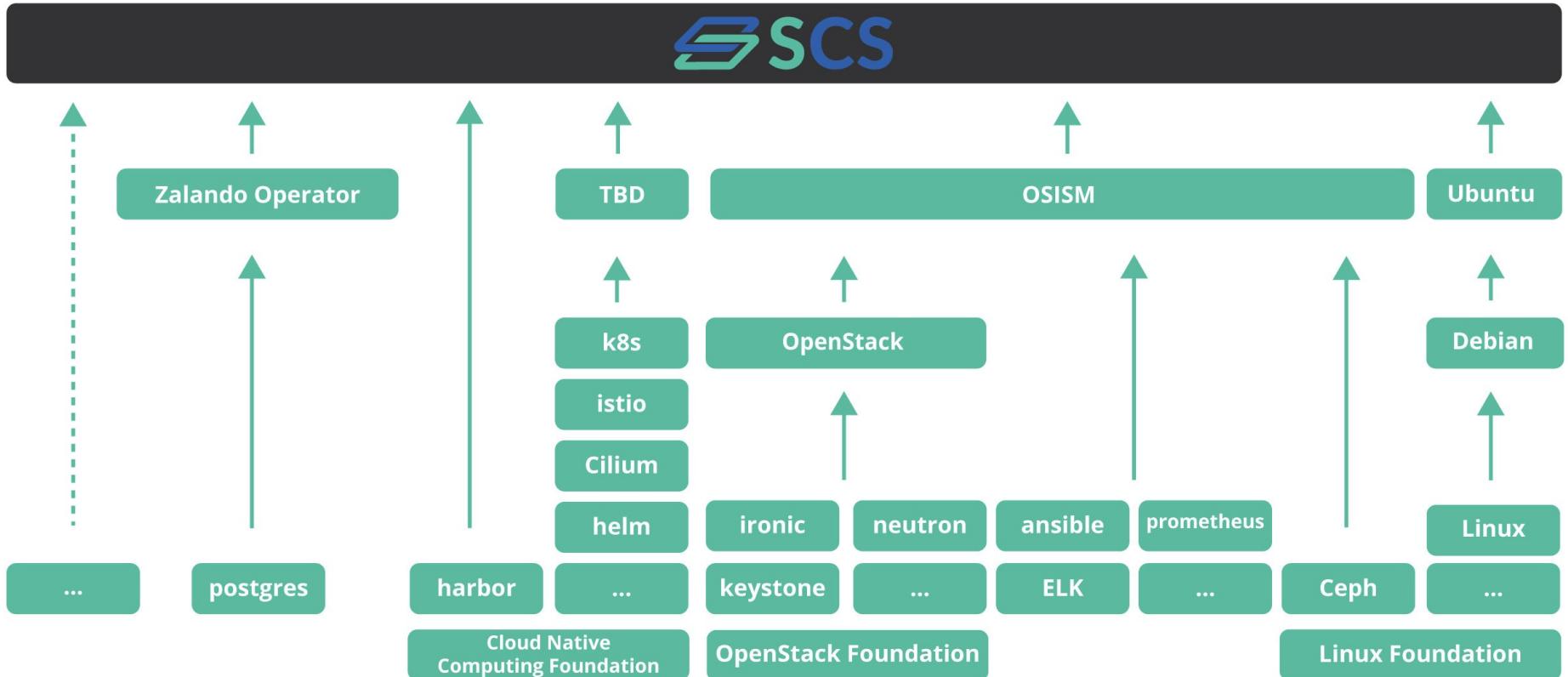
Modular Open Source
Reference Implementation



3

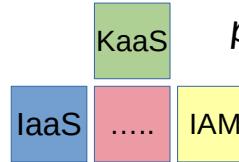
Operational Knowledge

SCS integrates, standardizes and complements proven building blocks



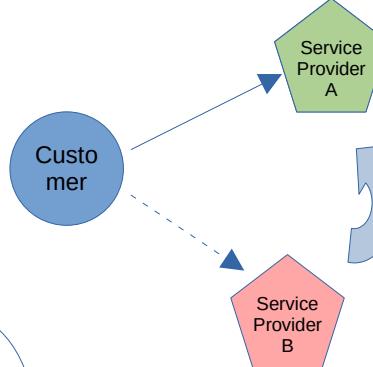
SCS Certified Standards provide...

Modularity



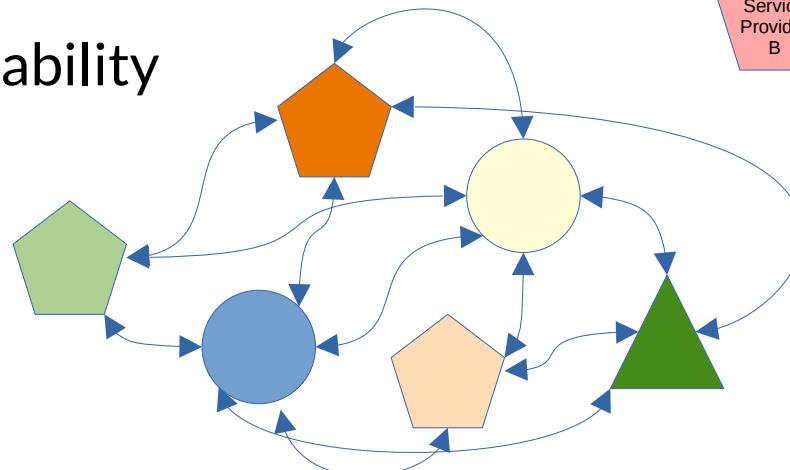
All pieces can be used independently or put together to build a complete stack.

Interoperability, Portability



Choose your service provider freely, transfer your data & applications easily and safely.

Federability, Scalability



Build a virtual hyperscaler.



tagesschau

Sendung verpasst?



Cloud-Anwendungen

Hacker-Angriff auf Microsoft war gravierend

Stand: 08.09.2023 12:03 Uhr

Open Operations

Share knowledge

e.g. monitoring setup and config

Share status

e.g. health & performance monitoring

Share challenges

e.g. fraud detection

Public Root Cause Analyses

e.g. outages

SCS Resources:

Operational Docs

Operator Lean Coffee

Blog

Tools:

e.g. Health-Mon dashboard

RCA templates

Link collection



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 Services based on SCS

pluscloud open



by

plusserver



Bundesamt
für Sicherheit in der
Informationstechnik

 **wavestack**

by

noris network



by



...more are under development.

SCS is involved in the German Federal Public Admin Cloud (Deutsche Verwaltungscloud DVC)



Deutsche Verwaltungscloud-Strategie
Übergreifende Etablierung und Nutzung von Standards für bestehende föderale Cloud-Lösungen der Öffentlichen Verwaltung

Clouds des Bundes

Clouds der Länder

Clouds der Kommunen

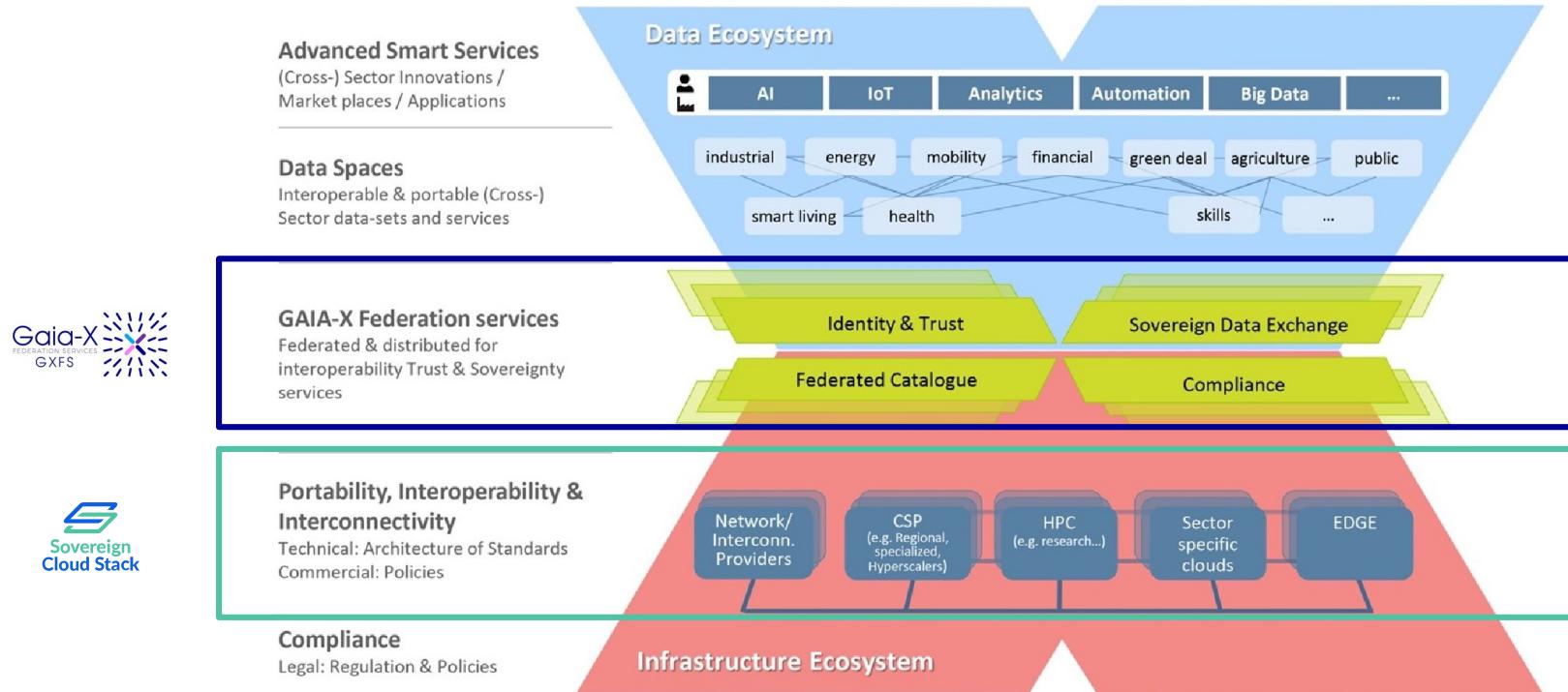
GAIA-X

Externe Anbieter

🔍 Bereiche zur Standardisierung föderaler Cloud-Lösungen

- 1 Entwicklung und Entwicklungsplattform**
Plattformen, Prozesse und Architekturvorgaben zur Entwicklung von Anwendungen
- 2 Anwendungsbereitstellung und -management**
Bereitstellung und Betreuung von Anwendungen über gesamten Lebenszyklus
- 3 Code Repository**
Verwaltungsumgebung zur Versionierung von Anwendungs-Code
- 4 Infrastruktur-Service und technologischer Stack**
Hard- und Software zur Erbringung von IT-Leistungen
- 5 Betriebsstandards und Betriebsmodell**
Zusammenarbeit IT-Dienstleister/Service-Bereitstellung

SCS provides a Technical Underpinning for Gaia-X



SCS contributes to GovStack

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



About ▾ Our Offerings ▾ Global Showcase News & Events Participate ▾



digital
impact
alliance



GovExchange

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

[Learn more](#)



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](#)



— An **OSB ALLIANCE** project —



<https://scs.community>

Supported by:



Federal Ministry
for Economic Affairs
and Climate Action



gaia-x

on the basis of a decision
by the German Bundestag



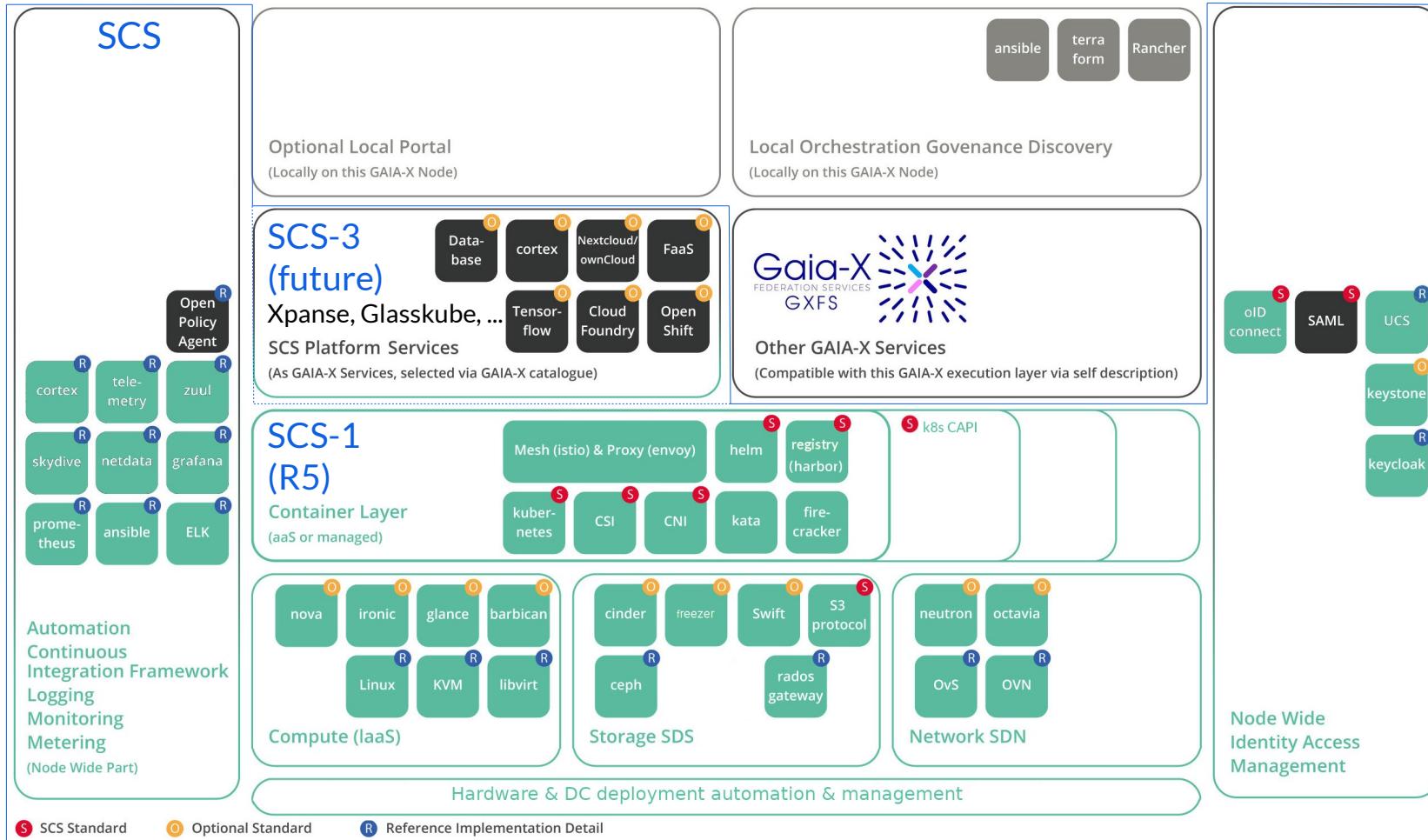
A large, majestic mountain peak, likely Mount Everest, rises from a sea of white clouds against a clear blue sky. The foreground shows dark, rugged mountain ridges. The overall scene is one of grandeur and scale.

<https://scs.community>

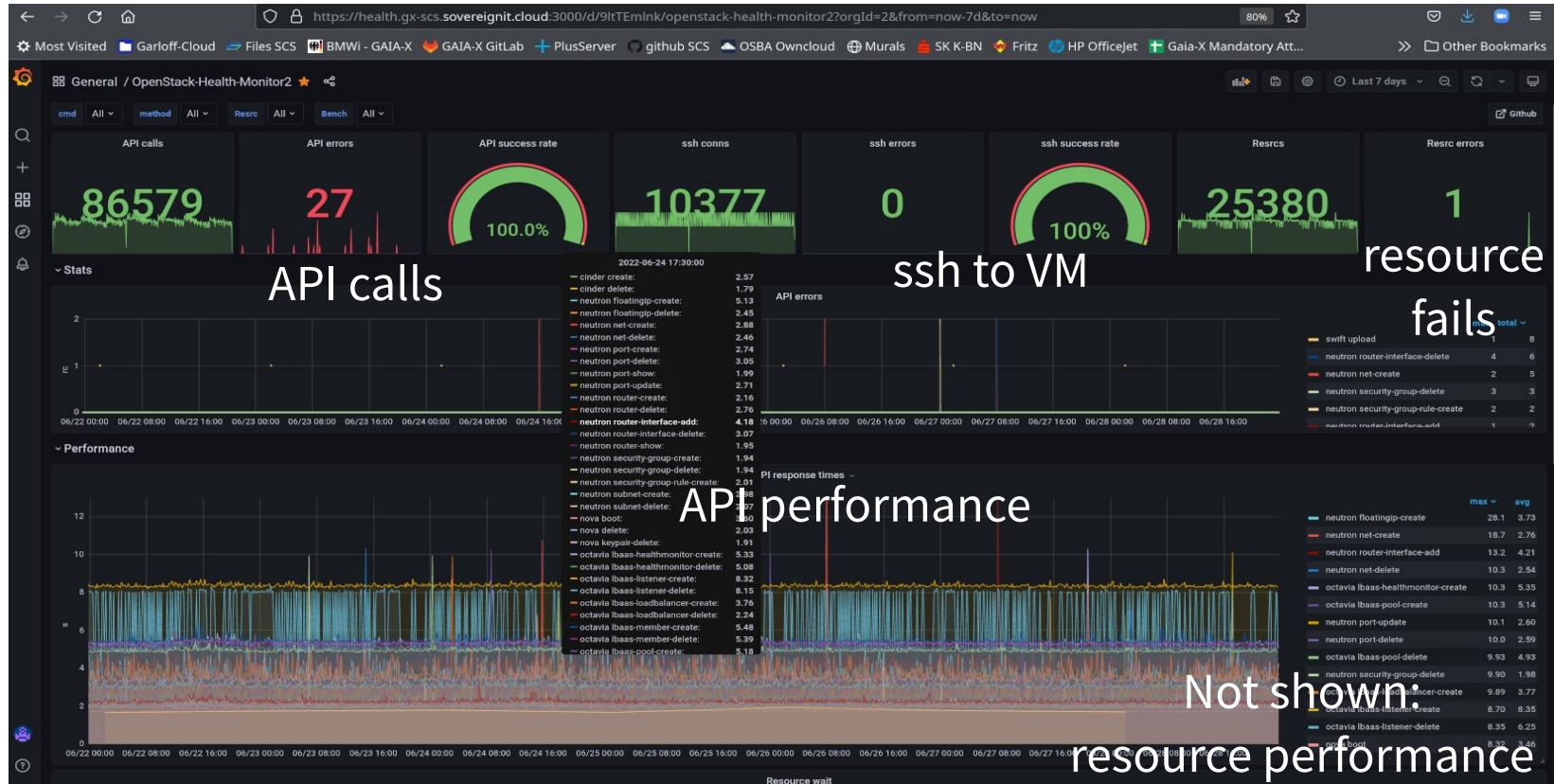
One platform – standardised, built and operated by many.

Supplement

SCS Reference Architecture (current status)



SCS Operations: Measure what you want to manage.



Operations: SCS Tooling

ara

Status	Report	Date	Duration	Hosts	Tasks	Results	Anible	Controller	Name (or path)	CLI	Labels
Green	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	
Green	17 Aug 2021 11:26:41 +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	
Green	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	
Green	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	
Green	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	
Red	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	
Green	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-delegate.yml	remote_user:dragon	check=False tags=all	

Kibana

Create index pattern

An index pattern can match a single source, for example, `filebeat-4-3-22`, or multiple data sources, `filebeat-*`.

Step 1 of 2: Define an index pattern

Index pattern name: log-2021.08.17

Include system and hidden indices:

Your index pattern can match your 1 source.

log-2021.08.17

Rows per page: 10

Keycloak

Welcome to Keycloak

Administration Console > Centrally manage all aspects of the Keycloak server

Documentation > User Guide, Admin REST API and Javadoc

Keycloak Project >

Mailing List >

Report an issue >

Netbox

Device Roles

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	✓	—

Configure Add Import Export

50 per page Showing 1-8 of 8

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					
9:30					
10					
10:30			10:05 - 10:55 GMT+2 Team IaaS Sprint Review/Planning and Refinement		
11	11:05 - 11:55 GMT+2 SIG Documentation			10:35 - 11:25 GMT+2 Team Container Sprint Review/Planning and Refinement	
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/Replace 15:05 - 15:55 GMT+2 Lean SCS Operator Overflow/Replace			15:05 - 15:45 GMT+2 Weekly SCS Community Meeting	
15:30		Coffee			

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, interoperable (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, SecTesting / PenTest
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/>



Gefördert durch:



<https://scs.community>



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.

