



# SCS: Building Open Source Cloud & Container Infrastructure

Gefördert durch:

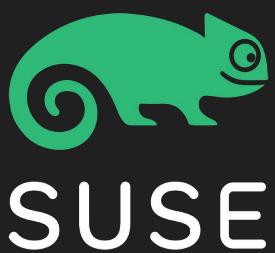
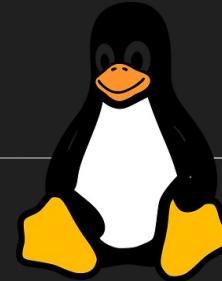


aufgrund eines Beschlusses  
des Deutschen Bundestages

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T-Systems

OSB  
Open Source  
Business  
ALLIANCE

Bundesverband für digitale Souveränität e.V.

Supported by:



on the basis of a decision  
by the German Bundestag



SPRIN-D



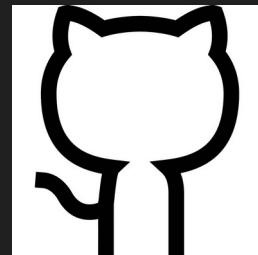
# Why I started w/ Open Source

- IT influences our lives & opportunities
  - Industry, Private life, Society & Government
- Want control in the hands of many / the civil society
  - Four freedoms (run, study&change, distribute, distribute changes)
- Collaborative approach results in better software



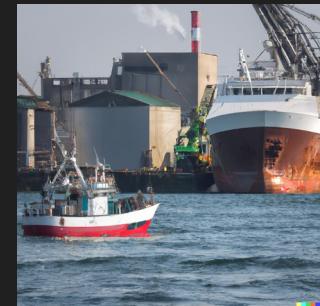
# Linux & OSS everywhere

- Linux on Smartphones, TVs, Routers, ... and the vast majority of servers
- Hard to develop software today without using OSS
  - workflows
  - libraries / components
  - tools



# Everything great?

- OSS software used to build proprietary software & platforms
  - Permissive licenses allow for it
- Power of large platforms
  - Proprietary Integration, Documentation, Configuration, Operation make it non-replicable
  - Network / platform effects favor winner-takes-it-all markets
- OSS deflection
  - Mongo, Elastic, Hashicorp, ... no longer using OSI compliant licenses
  - Why not copyleft?
- Open-washing
  - Open core, Closed dev process, Single-vendor, ...



# Open Source is not enough?

- Avoid other IP rights (patents) to take away freedoms
  - Some licenses partially address this (Apache, GPL3)
- CRA may put too high burden on OSS companies?
- Large projects are difficult to fork
  - Much prefer the ability to contribute and influence
  - Four Opens help: Open Community, Open Dev Process, Open Design, Fully Open Source
  - Operating Complex Systems can be hard: Open Operations



# 2020s Openness question

- How to avoid losing control in face of big (proprietary) platforms dominating IT? Digital Sovereignty?
- It's no longer individual OSS projects alone that determine the success
  - Because of integration, ... that can be huge
- Need to build well-integrated platforms out of many OSS solutions
- Need to play the platform game – providing some standardization to achieve scale effects



# Want Infra platform sovereignty

- 1) Legal compliance (GDPR)
- 2) Choice

Real choice requires low switching cost

Insourcing option

- 3) Ability to shape technology
- 4) Gain skills and transparency



# SCS vision



One platform  
—  
standardized,  
built and  
operated by  
many.

# SCS – network for a virtual hyperscaler

## Hyperscaler

Operated by one company in many regions

no in-sourcing option (except AzureStack)

very limited „sovereign“ (trustee) offers

Technology controlled by one entity

One set of centrally controlled standards  
and implementations

One set of User Identities

Some Open Source

Some transparency into Operations

## Virtual Hyperscaler

Operated by many companies

in-sourcing realistic

trusted local operators or self-operation

Technology controlled by the SCS community

Automatically testable and certifiable standards  
create interoperability - Federated user  
management (OIDC)

100% Open Source, Open Dev, Design,  
Community (4 Opens)

Open Operations

Joint knowledge building (tooling, practices, culture)  
High level of transparency

# Sovereign Cloud Stack Deliverables

The three pillars



# 1

Certifiable  
Standards



# 2

Modular Open Source  
Reference Implementation



# 3

Operational  
Knowledge

# Open Ops: You're not alone in Ops

## Share knowledge

e.g. monitoring setup and config

## Share status

e.g. health & performance monitoring

## Share challenges

e.g. fraud detection

## Public Root Cause Analysis

e.g. outages

### SCS resources:

Blog

OperationalDocs

Operator Lean Coffee  
Open Ops Meetup

### Tools:

e.g. Health-mon dashboard

Next: RCA templates  
Link collection

# Sovereignty Taxonomy

	US Hyper Scaler	Trustee	EU Hyper Scaler	Proprietary private	SCS public	SCS private
GDPR	-	+	++	+	+[2]	++
Choice						
- switching	-	-	-	o	+[4]	+[4]
- insourcing	- (o)[1]	-	-	+[3]	+	+
Tech shaping	-	-	-	-	+	++
Skills & Transp	-	-	-	o	+[5]	++[5]

[1] Options like AzureStack improve this

[2] Ecosystem ensures local providers can succeed

[3] Depends on whether others do the same

[4] SCS providers share meaningful standards

Implementation & Operations made easier by SCS

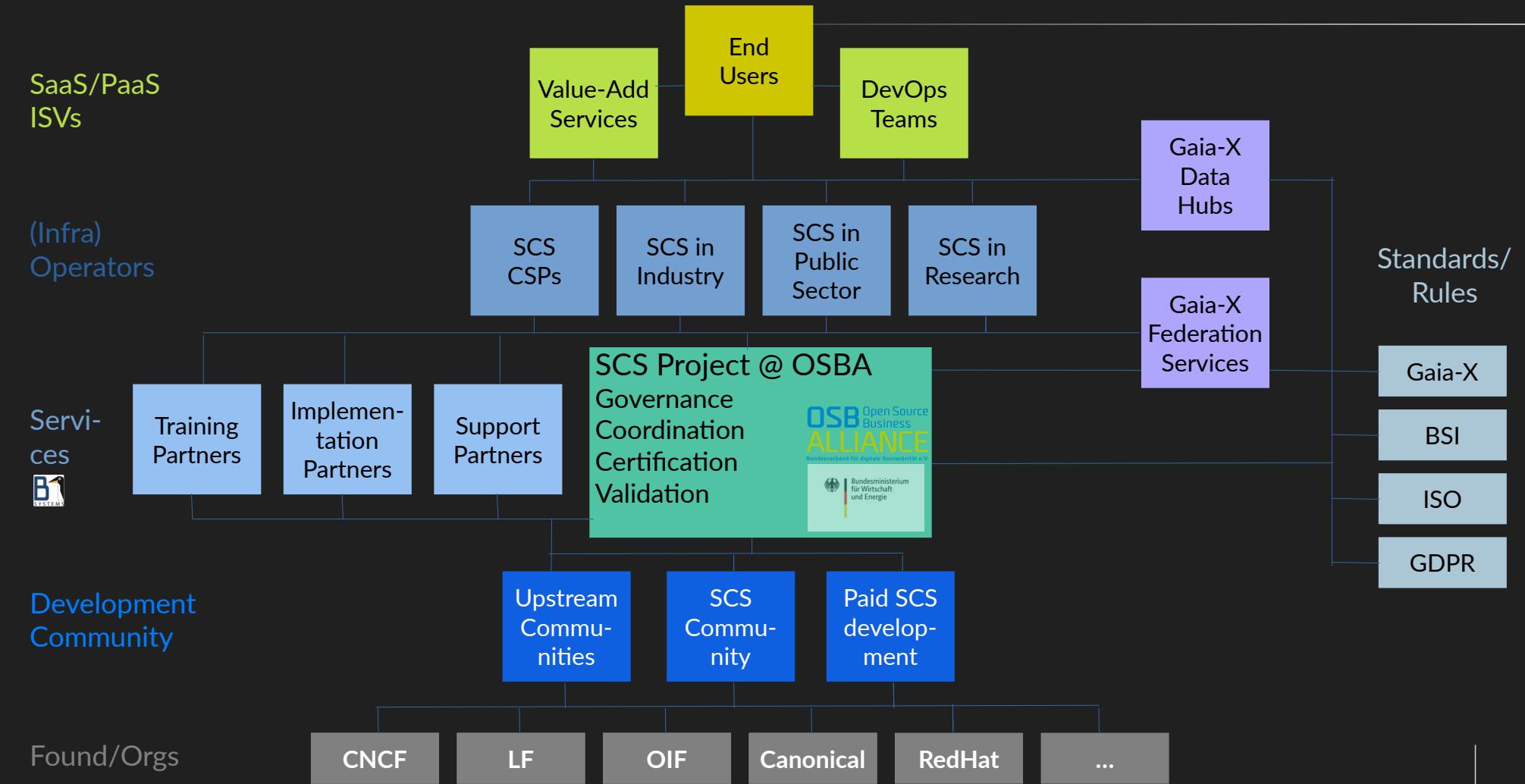
[5] Open Operations

# Putting SCS into reality

- Grant from BMWK (German Ministry for Economic Affairs and Climate Change)
- Project team @ OSB Alliance e.V. (non-profit)
- Paid development (public tenders)
- Community with >40 active members, collaboration with upstream & with Gaia-X
- Lots of publications, event presentations, ...
- 6 public clouds (betacloud, pluscloud open, wavestack, regio, aov, artcodix), private implementations TLRZ (B1), DAX, ...
- Integration partners (OSISM, B1, stackXperts, dNation, sysself, ...) can provide skilled support
- 5 releases of our reference implementation (2/a)
- Certification program in rollout



# Operators and Integrators



# Transparency ...

## IaaS SCS-compatible

Sovereign Cloud Stack - Standards and Certification

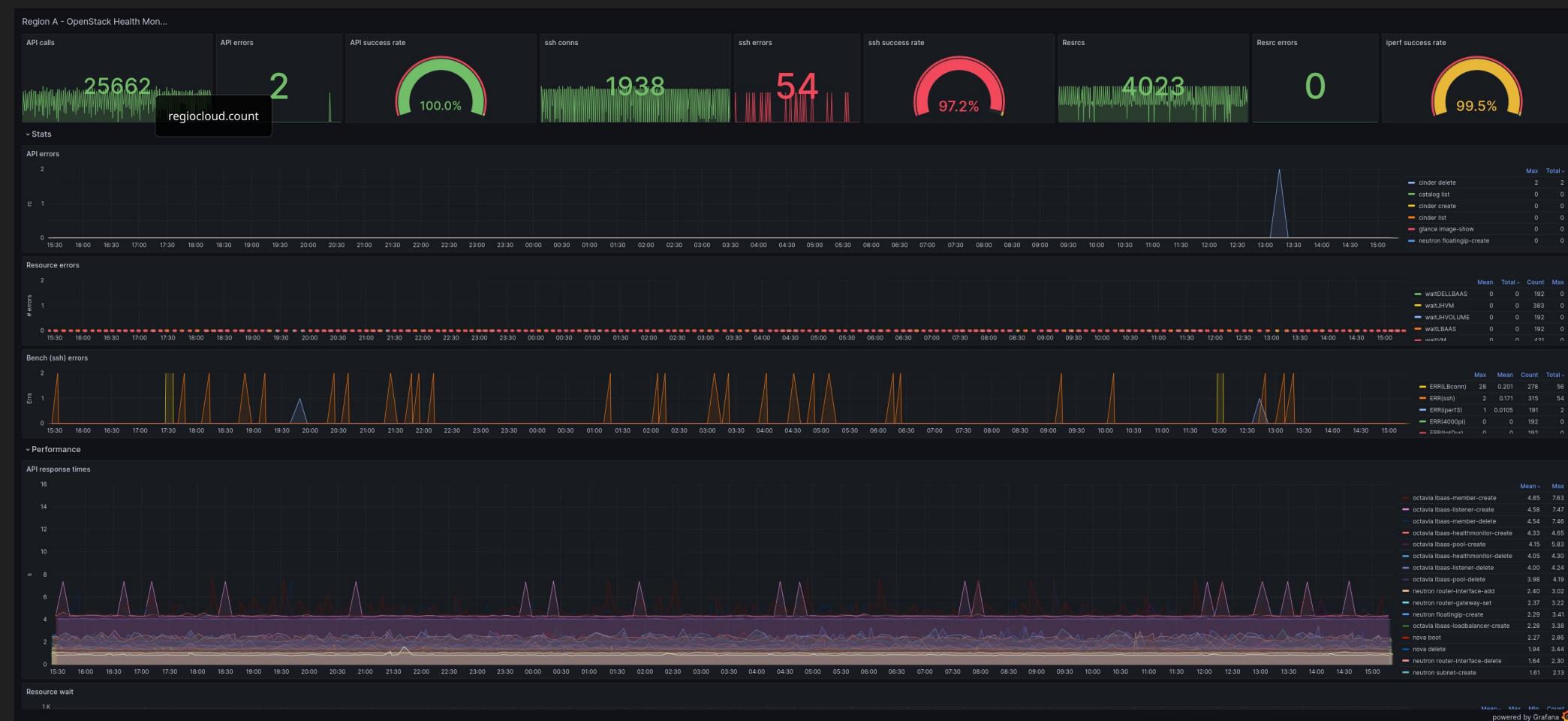
Active > SCS compatible clouds

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
<a href="#">gx-scs</a>	Dev environment provided for SCS & GAIA-X context	plusserver GmbH	<span>compliant</span> <span>passing</span>	<a href="#">HM</a>
<a href="#">pluscloud open - prod1</a>	Public cloud for customers	plusserver GmbH	<span>compliant</span> <span>passing</span>	<a href="#">HM</a>
<a href="#">pluscloud open - prod2</a>	Public cloud for customers	plusserver GmbH	<span>compliant</span> <span>passing</span>	<a href="#">HM</a>
<a href="#">Wavestack</a>	Public cloud for customers	noris network AG/Wavecon GmbH	<span>compliant</span> <span>failing</span>	<a href="#">HM</a>
<a href="#">REGIO.cloud</a>	Public cloud for customers	OSISM GmbH	<span>compliant</span> <span>passing</span>	<a href="#">Dashboard</a>

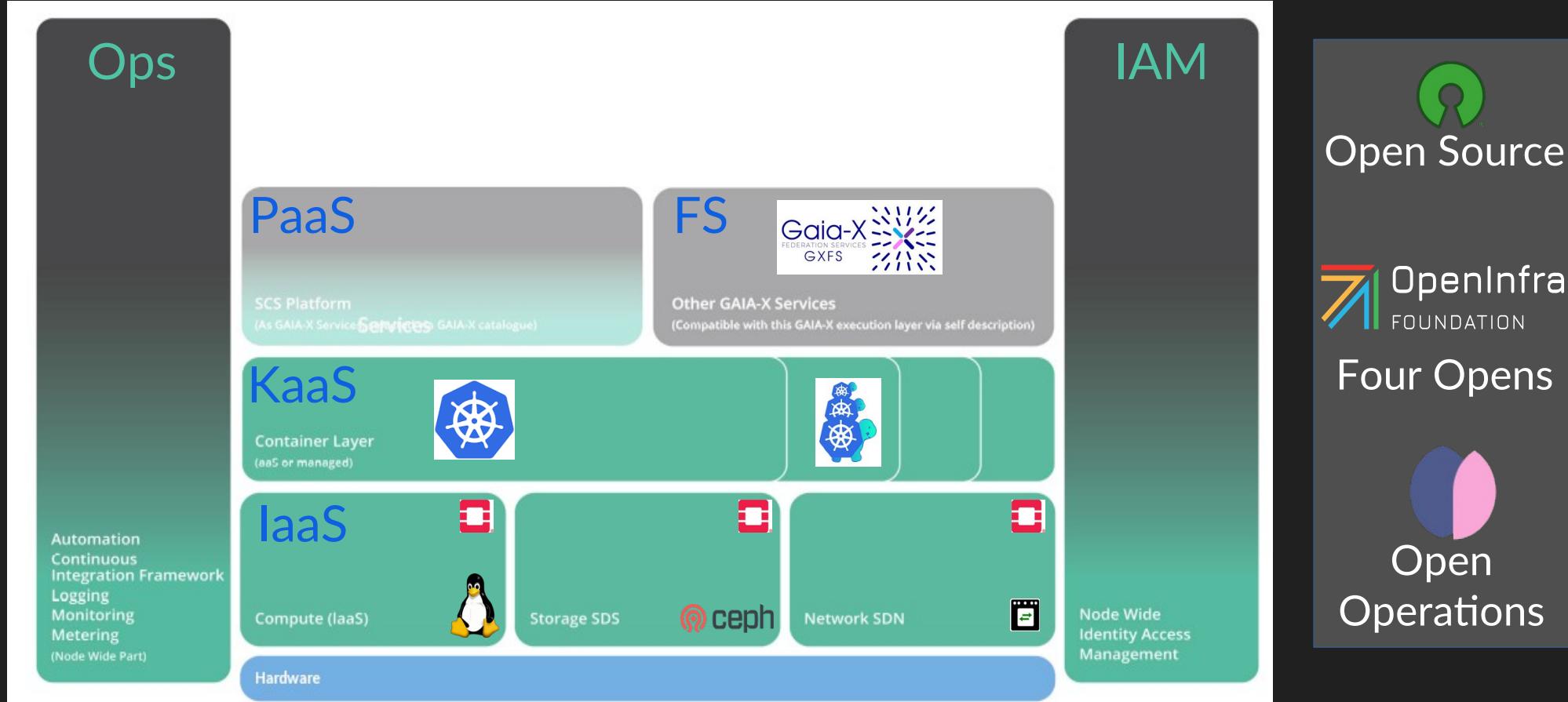
# ... and health-status

## openstack-health-monitor



# SCS Architecture (Software)

What's in it (currently)?



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

# Upcoming: SCS R5 (2023-09-20)

- IaaS layer
  - OpenStack 2023.1 (Antelope), ceph Quincy, OVN 23.06
  - Preferring diskless flavors (see blog article)
  - Official IPv6 support
  - OpenStack Resource Manager (clean up orphaned/broken resrc)
  - Improved metering (Tech Preview)
- Kubernetes layer
  - K8s v1.25 – v1.27 (v1.28 as Tech Preview)
  - cluster-api-1.5, cluster-api-openstack-0.7
  - Default to cilium CNI, optional gateway API (Tech Preview)
  - Full (optional) Harbor integration (roll out and use)
  - Robustness and security features (IP range filtering, resource limits, etcd backup, private CA support...)
- Vastly reworked documentation
- Extend zuul CI to k8s testing
- Improve federation (proxy domain in keycloak)



# References

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- Homepage: <https://scs.community/>  
Docs: <https://docs.scs.community/>
- Code: <https://github.com/SovereignCloudStack/>
- OpenOps: <https://openoperations.org/>
- OIF talks: <https://www.youtube.com/watch?v=i2hQQFJi3Yo>  
<https://www.youtube.com/watch?v=oGuUty7ufN8>
- Cloud report article:  
<https://the-report.cloud/why-digital-sovereignty-is-more-than-merely-legal-compliance>
- DuD article (DE)

# Advance Open Source!

- Join community <https://scs.community/contribute/>
- Contribute to SCS / upstream (LF, OIF, CNCF, ...)
  - Code, Docs, Issues, Standards, ...
- Apply (we're hiring!) or offer for our tenders
- Fight for sovereignty beyond legal compliance:  
Real choice, shaping, transparency&skills
- Implement SCS standards in your infra
- Implement SCS ref. impl. (as private or public cloud)
- Offer services
- Questions?

