



SCS: Building Open Source Cloud & Container Infrastructure

Gefördert durch:



Bundesministerium
für Wirtschaft
und Klimaschutz

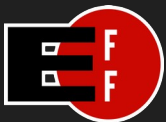
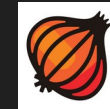
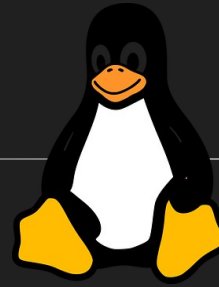
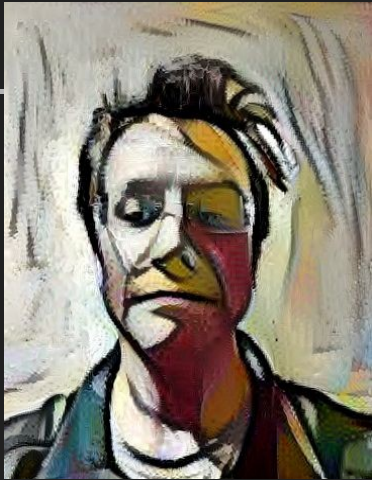
aufgrund eines Beschlusses
des Deutschen Bundestages

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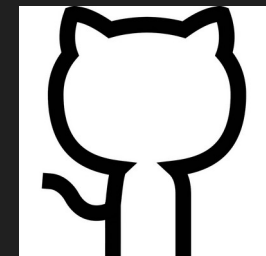
Why I started w/ Open Source

- 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



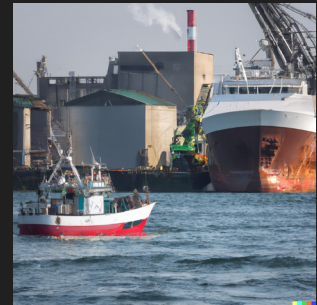
Linux & OSS everywhere

- 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 defection
 - 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.

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	-	-	-	0	+[4]	+[4]
- insourcing	- (o)[1]	-	-	+[3]	+	+
Tech shaping	-	-	-	-	+	++
Skills & Transp	-	-	-	0	+[5]	++[5]

[1] Options like AzureStack improve this

[2] Ecosystem ensures local providers can succeed

[3] Depends on whether others do the same

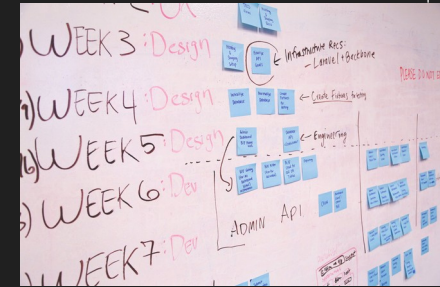
[4] SCS providers share meaningful standards

Implementation & Operations made easier by SCS

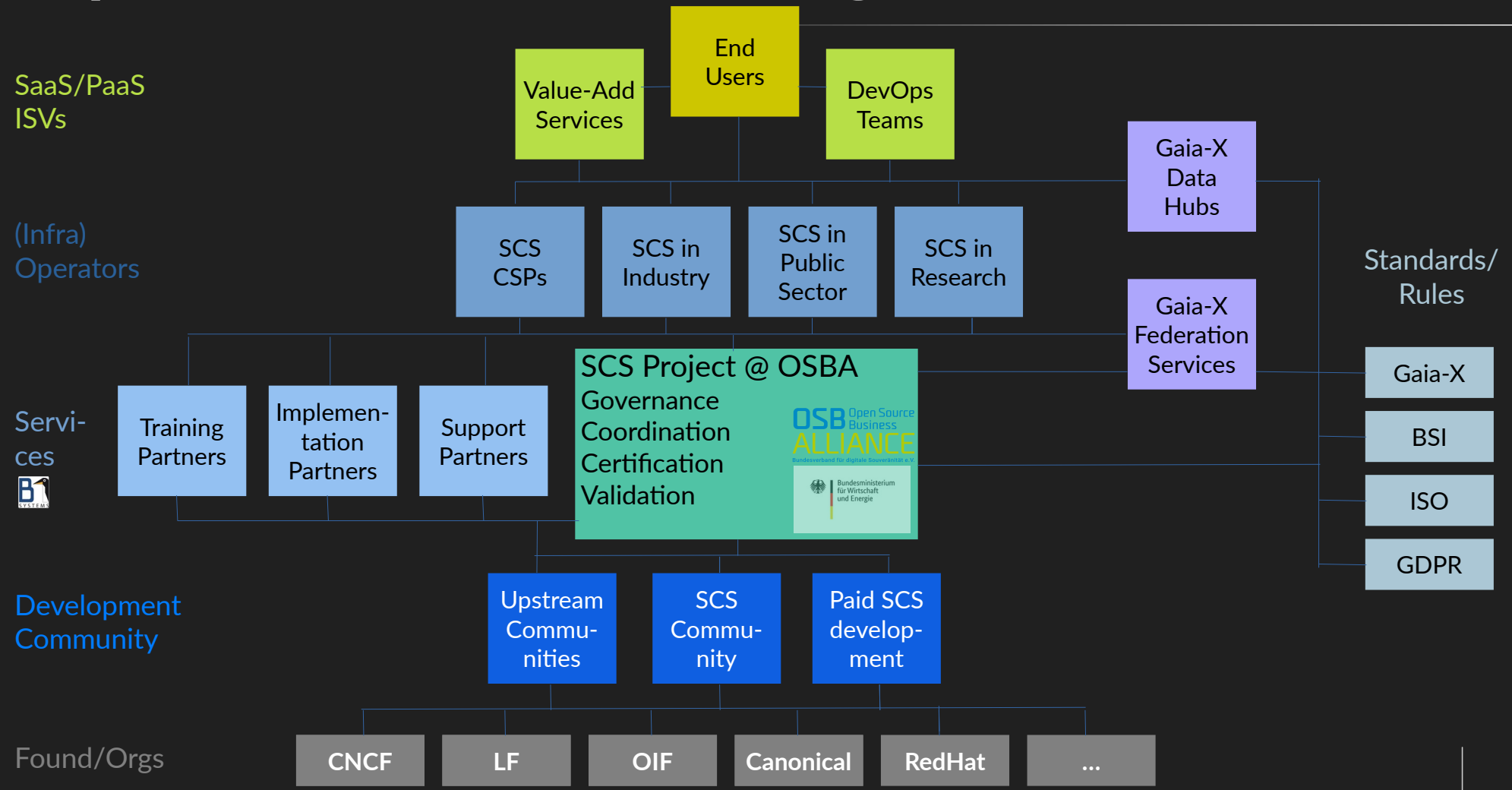
[5] Open Operations

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

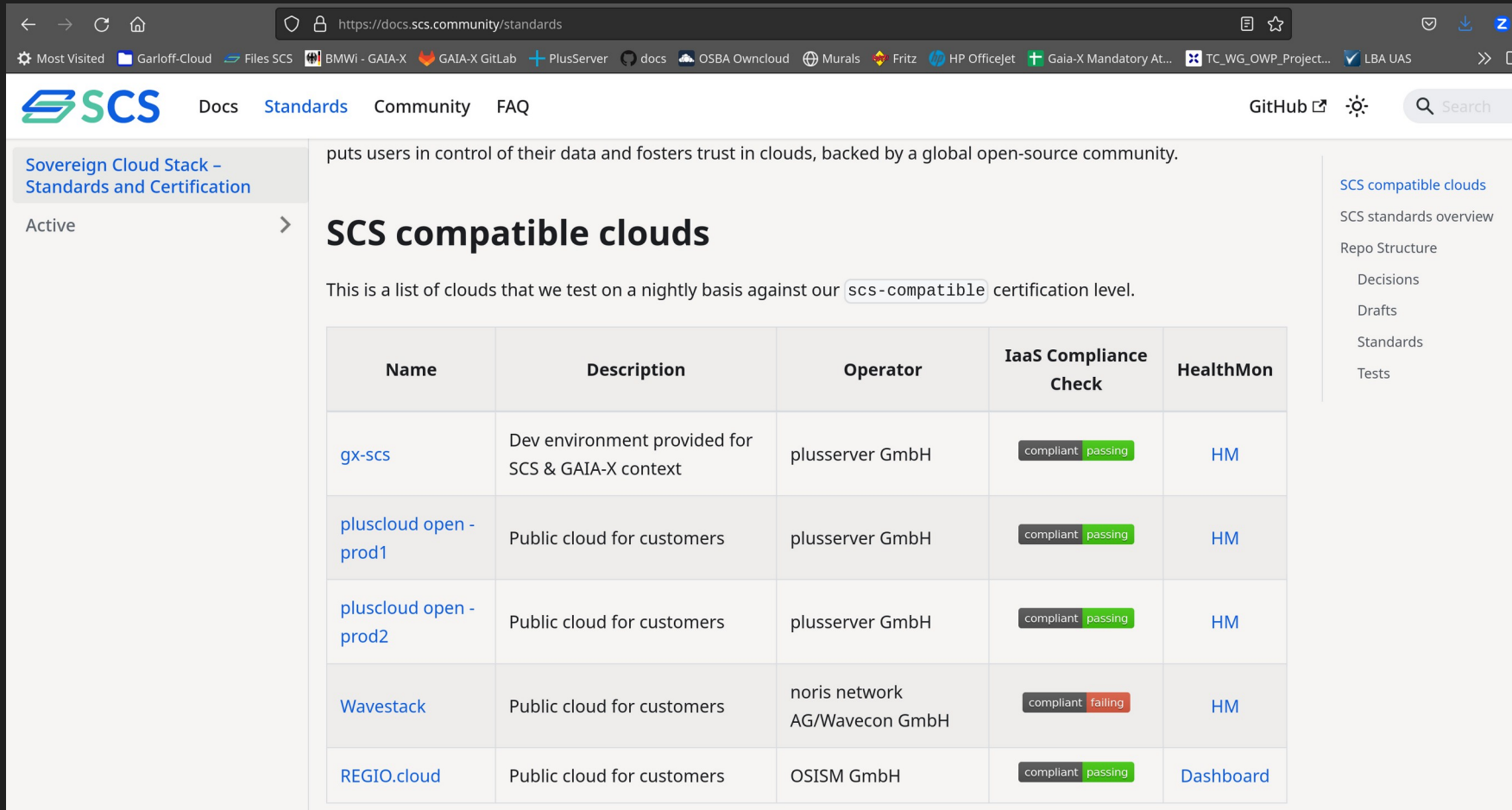


Operators and Integrators



Transparency ...

IaaS SCS-compatible



puts users in control of their data and fosters trust in clouds, backed by a global open-source community.

SCS compatible clouds

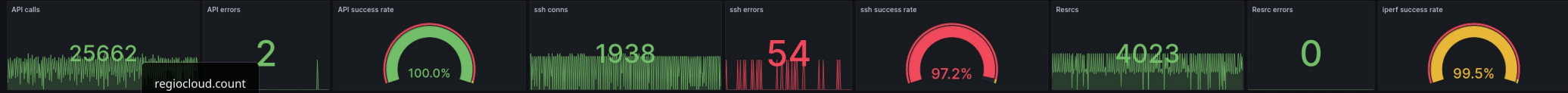
This is a list of clouds that we test on a nightly basis against our `scs-compatible` certification level.

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 failing	HM
REGIO.cloud	Public cloud for customers	OSISM GmbH	compliant passing	Dashboard

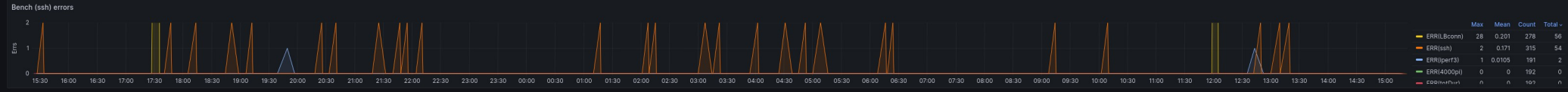
... and health-status

openstack-health-monitor

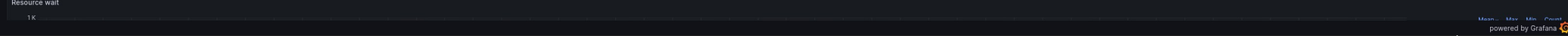
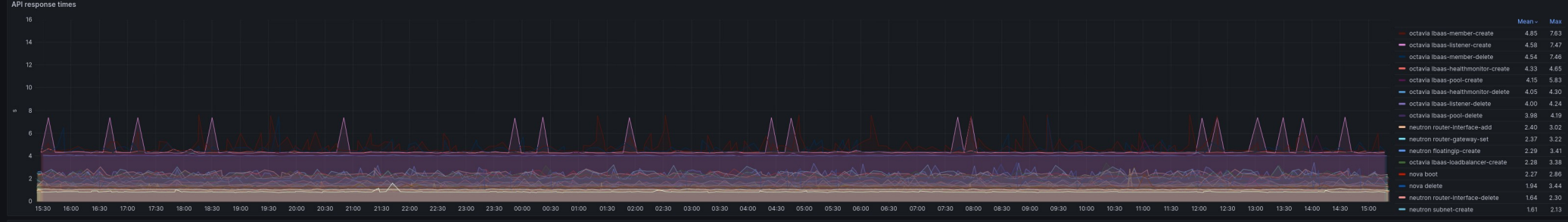
Region A - OpenStack Health Mon...



~ Stats



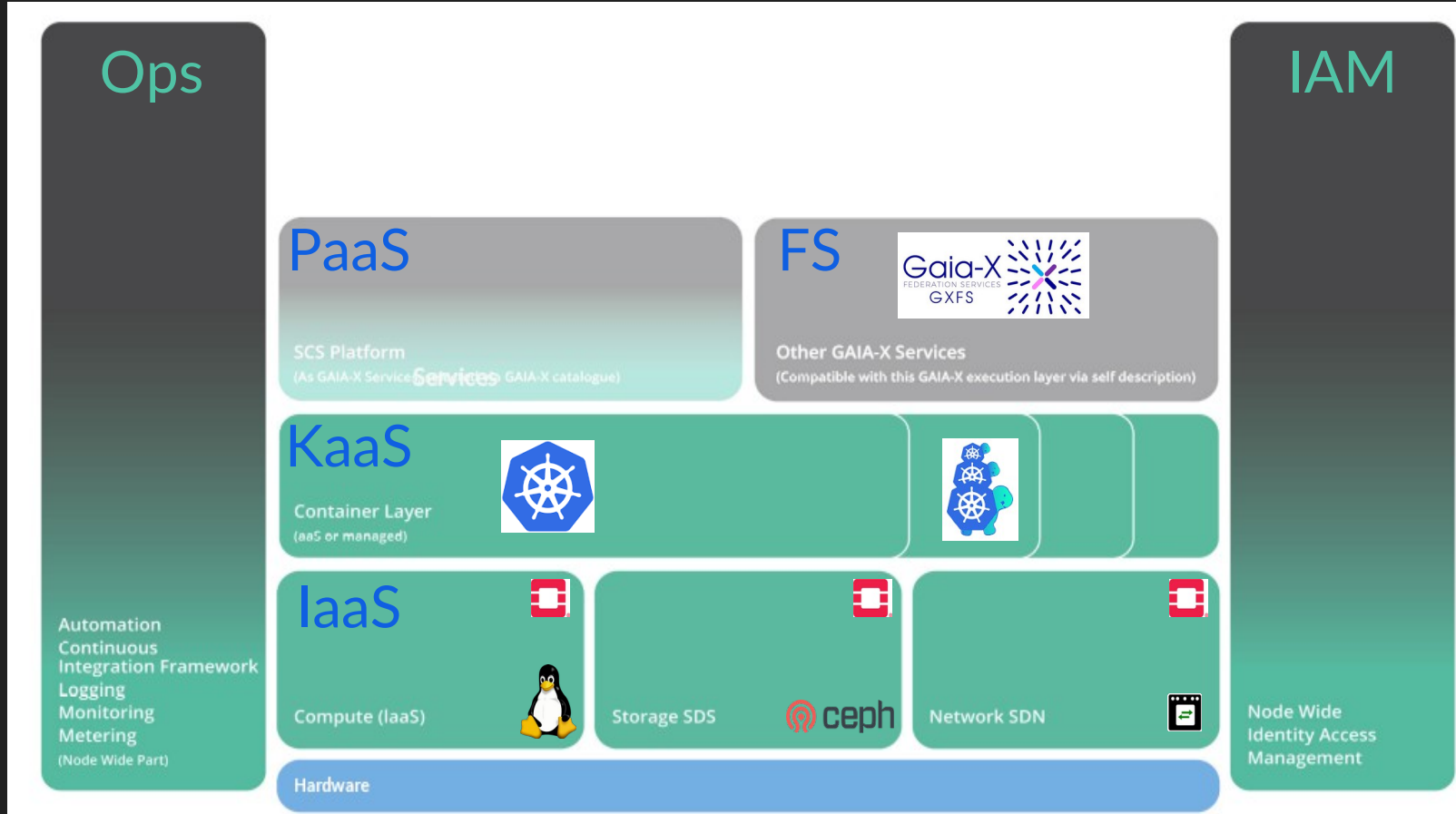
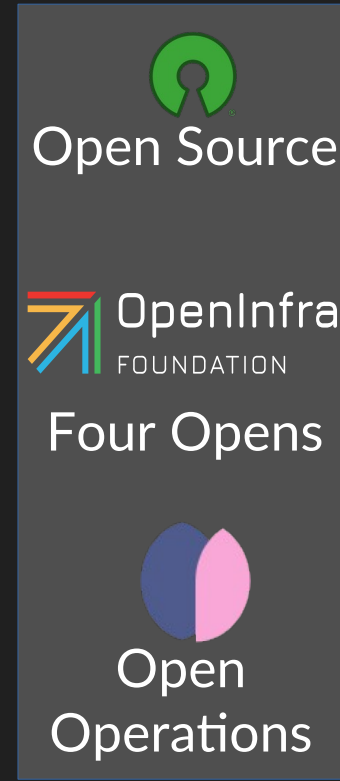
~ Performance



powered by Grafana

SCS Architecture (Software)

What's in it (currently)?

Open Source

OpenInfra FOUNDATION

Four Opens

Open Operations

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

- 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?

