

Sovereign Cloud Stack more than yet another cloud stack

**fOSS
asia**

FOSSASIA Summit 2022

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whoami

```
$ whoami  
fkr
```

```
$ finger fkr  
Login: fkr  
Job: PO IaaS & Ops  
E-Mail: fkr@osb-alliance.com
```

```
Name: Felix Kronlage-Dammers  
Where: OSB Alliance / SCS Project  
Twitter: @felixkronlage
```

Objective:

Create more value than you capture!
Only failures make us experts.

Plan:

If not working, either having fun with my son or riding a bike with drop bars.

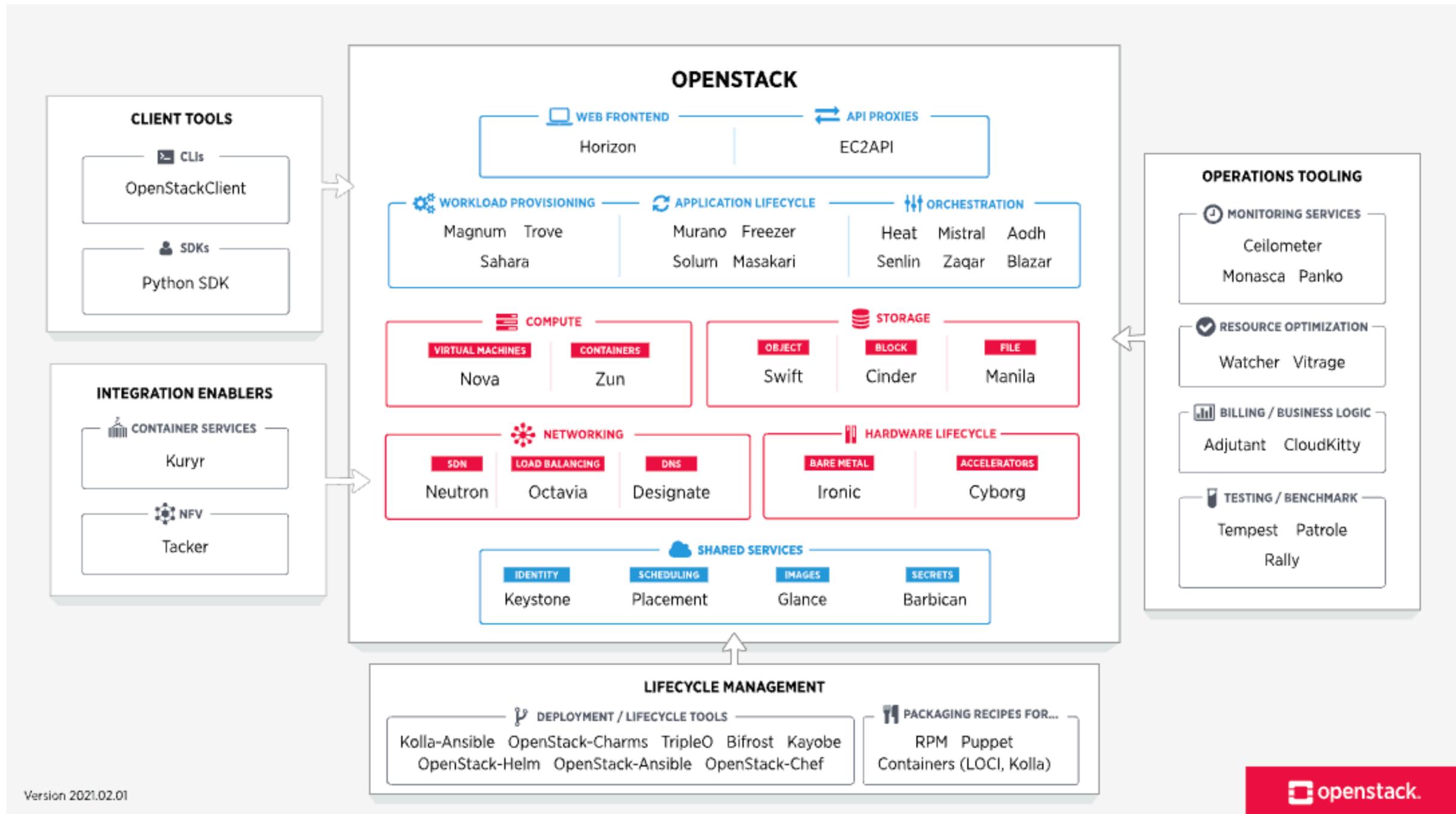
The Challenge

The Challenge

- Hyperscalers dominate the market
 - Dependencies (economic, strategic, legal challenges) → digitization barrier
 - Centralized control over platforms and data access
 - Control and Value creation mostly within large corporations

The Goods

- Many fantastic open source building blocks available
 - CNCF landscape
 - OpenInfra World
- Many fragmented efforts
- Example: managed kubernetes



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SCS - *The Project*

The Vision

Only Open Source guarantees digital sovereignty by interoperability, transparency and independence from unlawful claims of third parties and thus from any unauthorised interference.

Goals and Vision

- Standardization
- Certification
- Transparency
- Sustainability
- Federation



Who is behind the project?

OSB Open Source Business ALLIANCE

Bundesverband für digitale Souveränität e.V.



SPRIN-D

Open Source Business Alliance

- Organisation to strengthen Open Source
- Striving for Digital Sovereignty
- More than 190 companies as members
- Funded in 2011, merger of LISOG and LIVE

Digital Sovereignty

Today, digital sovereignty is an important aspect of general sovereignty, which refers to the ability to use and design digital systems, self-determination over aggregated and stored data, as well as over the related processes.

-Digital Gipfel 2018

Building blocks

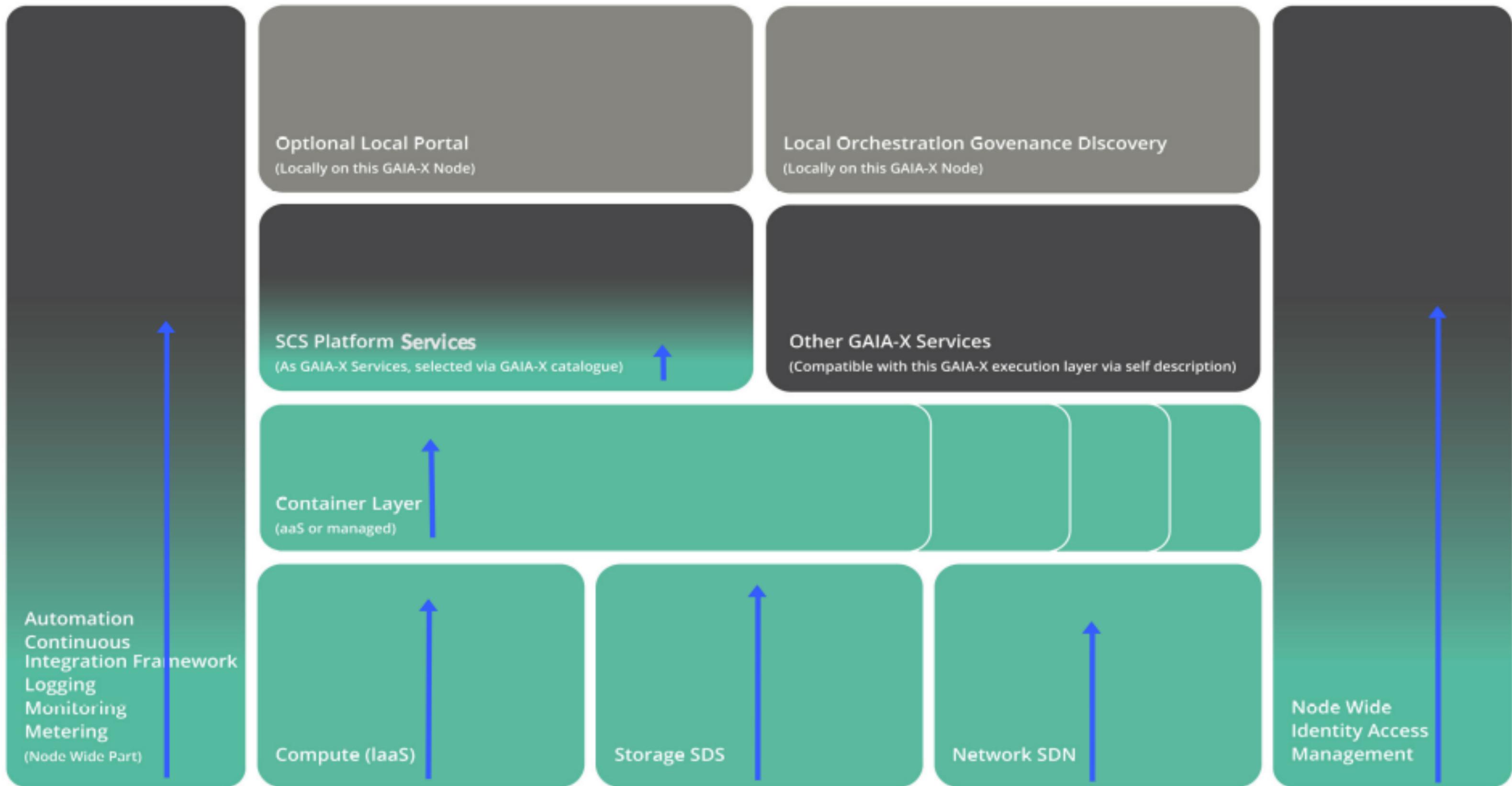
- Legal dimension
- Freedom of choice
- Technological dimension
- Dimension of competence

Buzzword Bingo Index

80 (out of 100)

Sovereign Cloud Stack

The Architecture



Automation
Continuous Integration Framework
Logging
Monitoring
Metering
(Node Wide Part)

Open Policy Agent (R)

cortex (R) telemetry (R) zuul (R)

skydive (R) netdata (R) grafana (R)

prometheus (R) ansible (R) ELK (R)

Optional Local Portal
(Locally on this GAIA-X Node)

Local Orchestration Governance Discovery
(Locally on this GAIA-X Node)

ansible terraform Rancher

SCS Platform Services
(As GAIA-X Services, selected via GAIA-X catalogue)

Database (O) cortex (O) Nextcloud/ownCloud (O) FaaS (O)

Tensor-flow (O) Cloud Foundry (O) Open Shift (O)

Other GAIA-X Services
(Compatible with this GAIA-X execution layer via self description)

Container Layer
(aaS or managed)

Mesh (istio) & Proxy (envoy) (S) helm (S) registry (harbor) (S)

kubernetes (S) CSI (S) CNI (S) kata (S) firecracker (S)

Compute (IaaS)

nova (O) ironic (O) glance (O) barbican (O)

Linux (R) KVM (R) libvirt (R)

Storage SDS

cinder (O) freezer (O) Swift (O) S3 protocol (S)

ceph (R) rados gateway (R)

Network SDN

neutron (O) octavia (O)

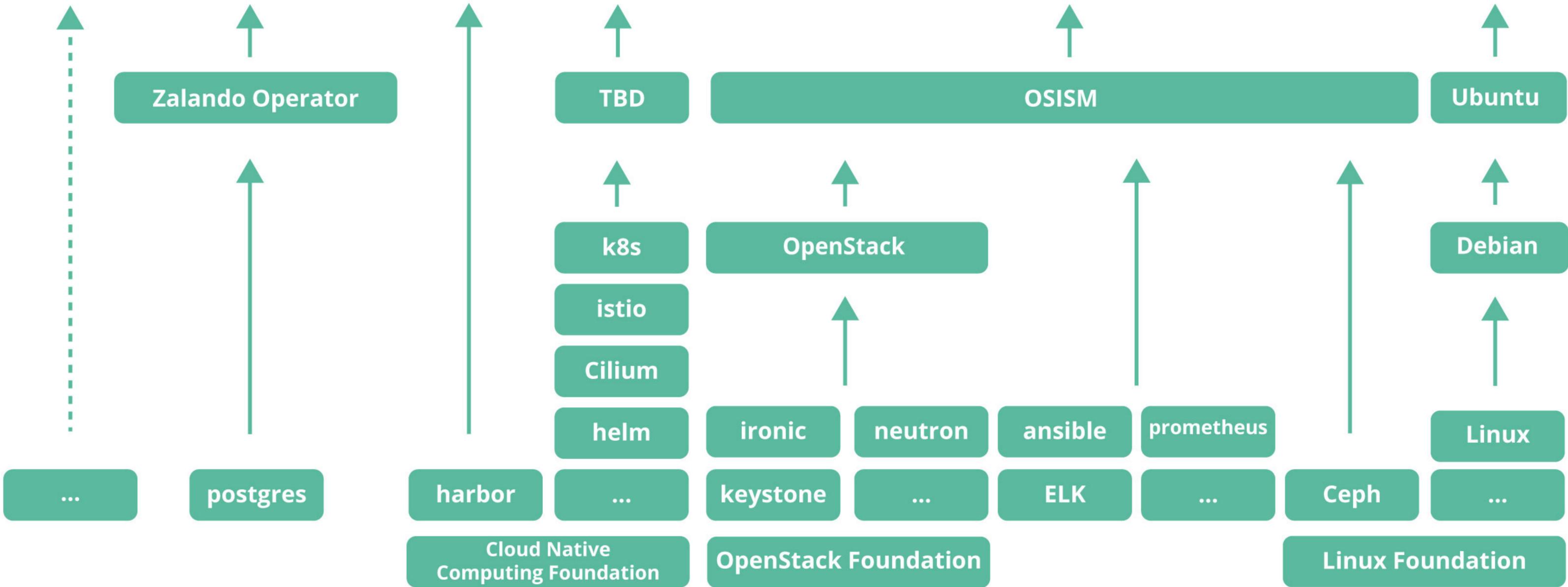
OvS (R) OVN (R)

Node Wide Identity Access Management

oID connect (S) SAML (S) UCS (R)

keystone (O)

keycloak (R)



Releases - Roadmap

Releases 2021

- Release 0

- Fully automated Infra, IaaS, Ops automation (CI/CD, Monitoring, Patching), local IAM
- Technical Preview for Container Stack (k8s cluster API, incl. CNI/CSI, helm)

- Release 1

- Container Stack in production quality
- Federation (OIDC)
- More preconfigured monitoring and logging

Release(s) 2022

- Release 2

- More Container work (cluster API, k8s, registry, multi-AZ/multi-cloud, rolling upgrades in prod)Federation (OIDC)
- Ops Stack: More preconfigured Metering, Monitoring, Logging, Alerting
- Federation: Cmd line tool support OpenStack
- More Bare Metal automation
- Extend CI coverage

The Community

How we work

- Out in the open ;)
- Weekly team calls
 - SCS Project Team
 - Operators (CSPs) and Integrators
 - Companies participating in the tenders
 - Volunteers

Collaboration over Competition



23 | Technologies



StackHPC



Use SCS

The Testbed

- Virtual Testbed
 - <https://github.com/osism/testbed>
- Easily deployed on various public clouds

Deployment



ARA Records Ansible
Ansible logs

#dashboard



NetBox
Infrastructure Resource Modeling (IRM)

Operations



Ceph
Ceph dashboard



Flower
Distributed Task Queue



Keycloak
Identity and Access Management (IAM)



phpMyAdmin
Administration of MariaDB



RabbitMQ
Administration of RabbitMQ

Insights



Grafana
Observability platform



Kibana
Visualized logs



Netdata
Realtime monitoring



Patchman
Linux Patch Status Monitoring System



Prometheus
Monitoring system & timer series database

User interfaces



Horizon
OpenStack dashboard

File Edit View History Bookmarks Tools Help

Dashboard - Nextcloud SCSx Usage — OSISM Testbed docu x Device Roles - NetBox x Problem loading page x Welcome to Keycloak x Index patterns - Elastic x ara | Playbook reports: 1-3 x +

192.168.16.5:8121/dcim/device-roles/ 120% ☆

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netbox Organization Devices IPAM Virtualization Circuits Power Secrets Other

Search

Configure + Add Import Export

Device Roles

<input type="checkbox"/>	Name	Devices	VMs	Color	VM Role	Description	
<input type="checkbox"/>	Ceph control node	0	0		✓	—	
<input type="checkbox"/>	Ceph resource node	0	0		✓	—	
<input type="checkbox"/>	Compute node	0	0		✓	—	
<input type="checkbox"/>	Control node	0	0		✓	—	
<input type="checkbox"/>	Generic node	0	0		✓	—	
<input type="checkbox"/>	Manager node	0	0		✓	—	
<input type="checkbox"/>	Monitoring node	0	0		✓	—	
<input type="checkbox"/>	Network node	0	0		✓	—	

Edit Selected Delete Selected

50 per page Showing 1-8 of 8

File Edit View History Bookmarks Tools Help

Dashboard - N x Usage — OSISM 1 x testbed-man x Problem loadi x Problem loadi x Problem loadi x Device Roles x Problem loadi x Welcome to K x Create index p x ara | Playbook x +

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testbed-manager.osism.test

Playing 17/08/2021 • 15:16 → 15:22 • last 6min

System Overview

Overview of the key system metrics.

Disk Read: 0.0 KB/s

Disk Write: 0.50 MB/s

CPU: 3.5

Net Inbound: 0.98 megabits/s

Net Outbound: 0.03 megabits/s

Used RAM: 40.9 %

cpu

Total CPU utilization (all cores), 100% here means there is no CPU idle time at all. You can get per core usage at the [CPUs](#) section and per application usage at the [Applications Monitoring](#) section. Keep an eye on **lowait** (0.40%). If it is constantly high, your disks are a bottleneck and they slow your system down. An important metric worth monitoring, is **softirq** (0.05%). A constantly high percentage of softirq may indicate network driver issues.

Total CPU utilization (system.cpu)

percentage

- steal 0.00
- softirq 0.05
- user 1.26
- system 1.36
- lowait 0.40

Di., 17. Aug. 2021 | 15:22:20

Pressure Stall Information identifies and quantifies the disruptions caused by resource contentions. The "some" line indicates the share of time in which at least some tasks are stalled on CPU. The ratios (in %) are tracked as recent trends over 10-, 60-, and 300-second windows.

CPU Pressure (system.cpu_pressure)

- System Overview
- CPUs
- Memory
- Disks
- Filesystem
- Mount Points
- Networking Stack
- IPv4 Networking
- IPv6 Networking
- Network Interfaces
- Firewall (netfilter)
- systemd Services
- Applications
- User Groups
- Users
- eBPF
- cephclient
- cron
- fluentd
- heimdall
- keycloak
- keycloak postgres
- kolla toolbox
- manager ara-server 1
- manager ceph-ansible 1
- manager inventory reconciler 1

Resources

- <https://scs.community>
- <https://github.com/SovereignCloudStack>
- <https://scs.community/2022/03/18/digital-sovereignty-whitepaper/>
- https://twitter.com/scs_osballiance
- [#scs-general:matrix.org](https://scs-general.matrix.org)

Thanks for **your** time ;)