

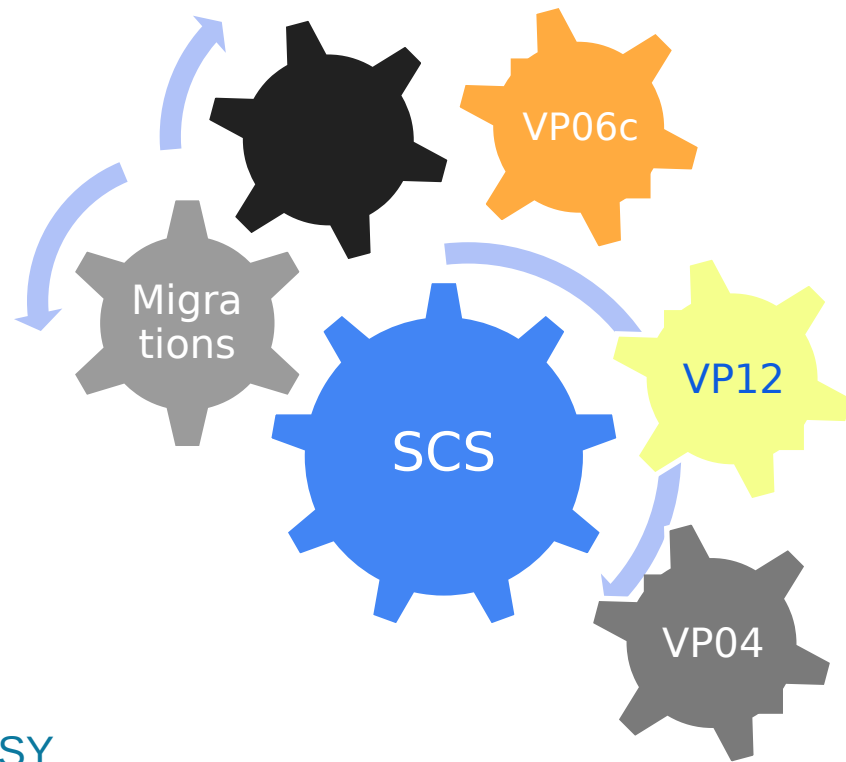


Bundesministerium
für Wirtschaft
und Klimaschutz

SCS & dNation:

What we have accomplished
together in last 2 years

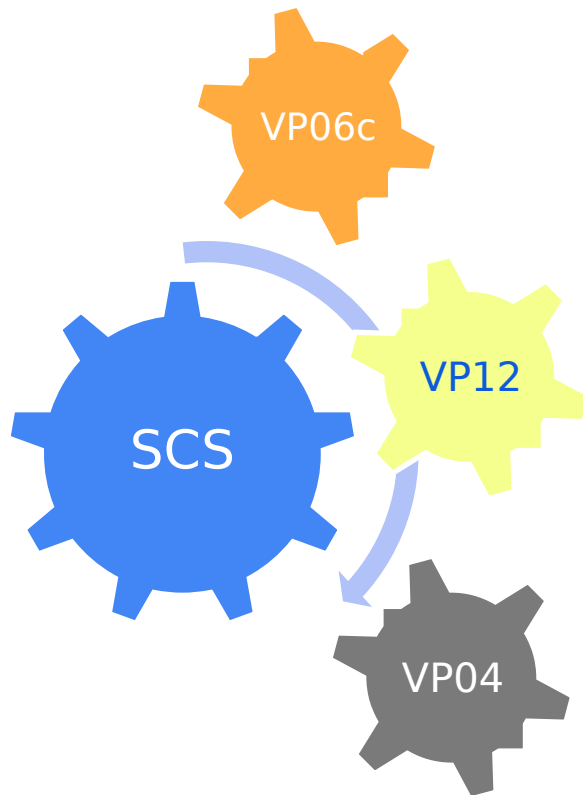
Martin Pilka, CEO, dNation - MAKING CLOUD EASY



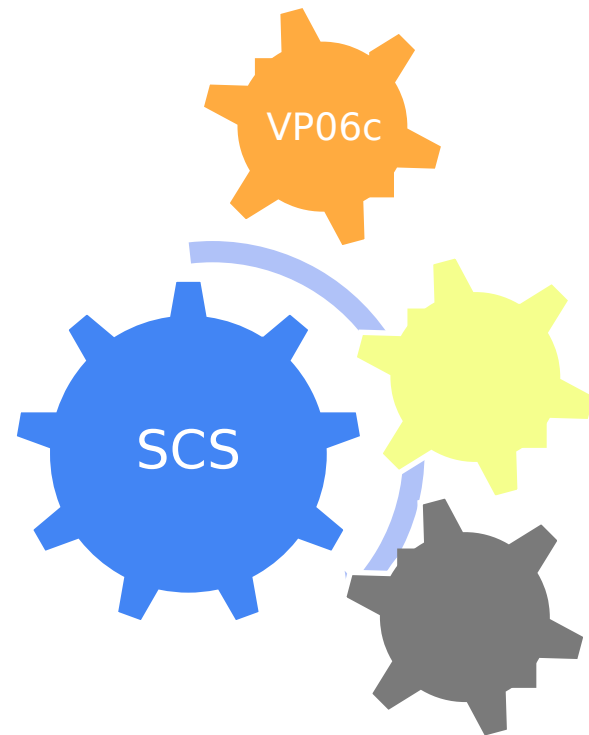
dNation: d = Development | DevOps

dNation won following SCS tenders:

- SCS-VP06c Container Registry
- SCS-VP12 Health Monitoring
- SCS-VP04 Networking
- Involved in KaaS (Kubernetes as a Service)
- Involved in SCS monitoring



SCS-VP06c Container Registry



SCS-VP06c: Challenge

Currently deployed solution was:

- Outdated, running old version of Harbor
- Didn't scale very well
- Didn't contain any security features, e.g. automatic scan for known vulnerabilities

SCS-VP06c: Solution

- Successful migration to the new Harbor version in May 2023
- Lift and shift approach, deployed latest version of Harbor
- High Availability (HA) of Harbor fundamental components
- Storage migration from PV to the object storage
- Backed up with Velero
- Described in the blog:

[SCS container registry migration and upgrade](#)

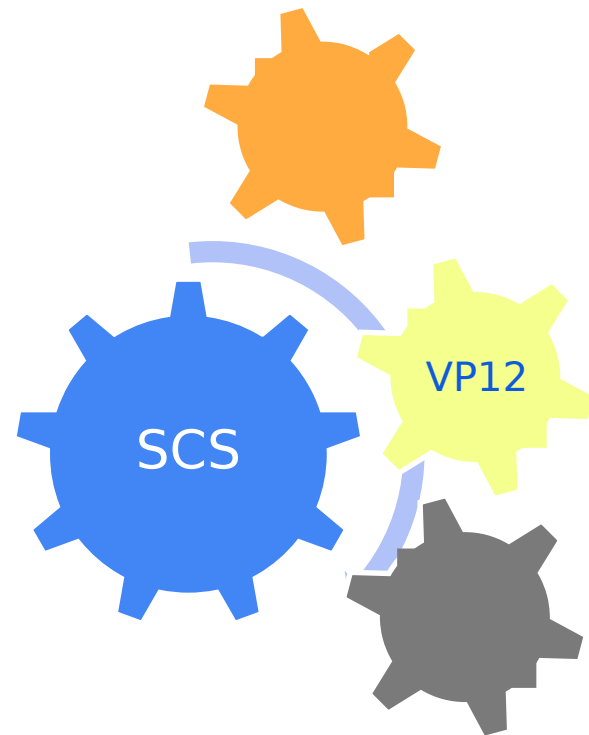
SCS-VP06c: Additional Functionality

- Proxying and caching major repositories: docker.io, ghcr.io or quay.io
- Daily security scans with Trivy security scanner
- OIDC authentication, rate-limit protection
- Automatic garbage collection and log rotation
- Storage quotas, webhooks, content signing/validation
- Used in [production](#) by both SCS community and dNation
- [Docs](#), [Repository](#)

SCS-VP06c: Kubernetes as a Service (KaaS)

- Participating on both SCS [KaaS v1](#) and [KaaS v2](#)
- Integration with SCS Container Registry
- Implemented Cluster Stack Provider OpenStack (CSPO) and OpenStack plugin for csctl
- Target Platform: Hetzner
- Multiple upstream contributions

SCS-VP12 Health Monitoring



SCS-VP12: Challenge

Existing blueprint monitoring script written in Bash was:

- Difficult to maintain
- Difficult to extend with new functionality, mostly because of Bash shell language limitations

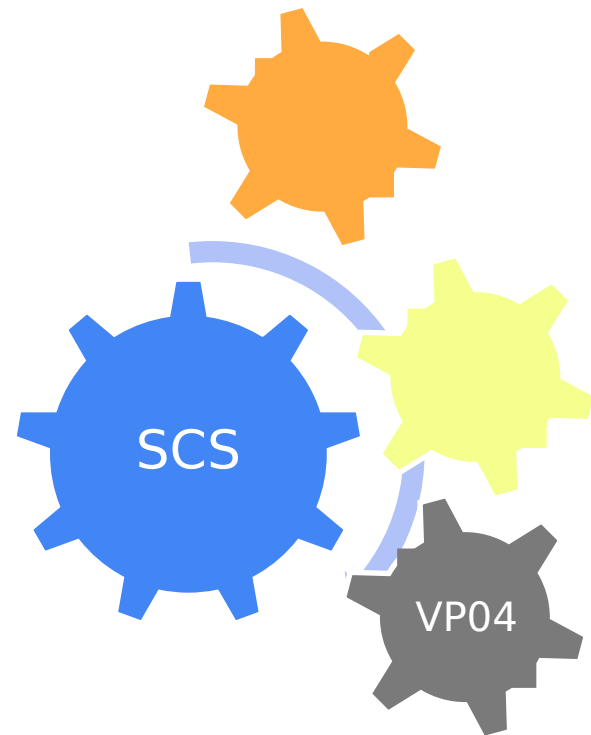
SCS-VP12: Solution

- Primary goal: Automating the health monitoring of SCS infrastructure on OpenStack and Kubernetes
- Selection of appropriate tools for behavior-driven development (BDD)
- Behave framework for writing tests in Gherkin language
- Python on backend
- BehaveX for generating reports

SCS-VP12: SCS Health Monitoring Framework

- Covers functionality of the old monitoring script
- Health monitoring of both IaaS and KaaS layers
- Easy to scale
- Easy to onboard new developers
- [Docs](#), [Repository](#)

SCS-VP04 Networking



SCS-VP04 Challenge: Encryption not used everywhere

- OpenStack uses encryption when talking to outside world
- However OpenStack internal components do not use encryption
- It is an issue for security sensitive application

SCS-VP04 Solution

E2E Encryption between OpenStack internal components

- Identifications of components
- Check whether or not encryption is supported by a component
- Enabling or adding encryption capabilities
- Over 20 upstream pull requests in Kolla-Ansible and related repositories
- PoC with Kolla-Ansible utilizing IPsec
- Whole effort aimed to make OpenStack installations more secure

SCS-VP04 Challenge: Poor Network Scalability

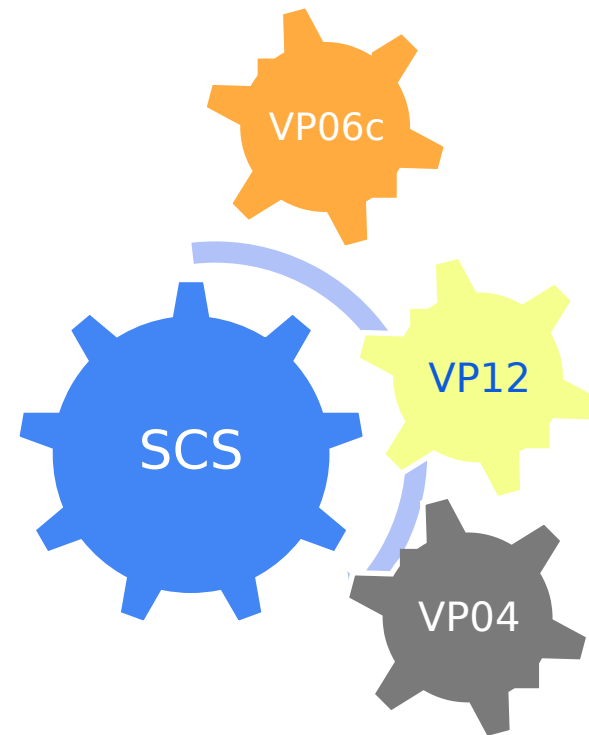
Scalability for Software Defined Networking (SDN)

- Networking layer in default OpenStack installation doesn't scale well above ~700 nodes

SCS-VP04 Solution

- SONiC - Software for Open Networking in the Cloud
- Automated provisioning and management of SONiC devices
- PoC for SDN network scalability and cloud interconnectivity

SCS Monitoring Platform



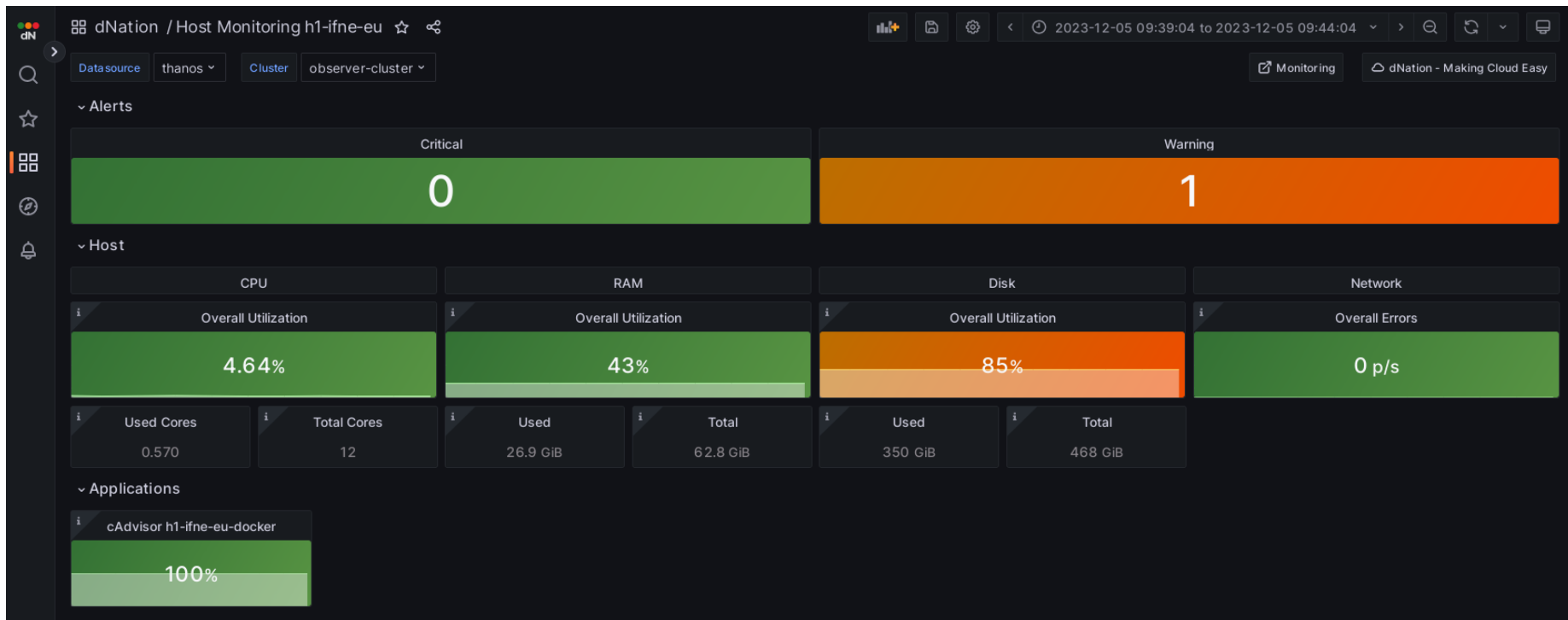
SCS Monitoring Platform

- The SCS Monitoring platform has been developed on the foundation of [dNation Monitoring](#)
- **Green** - everything is fine, I can go to lunch
- **Orange** - not urgent issue, I can go to lunch but have to check after I return
- **Red** - urgent issue, I can't go to lunch, have to check immediately

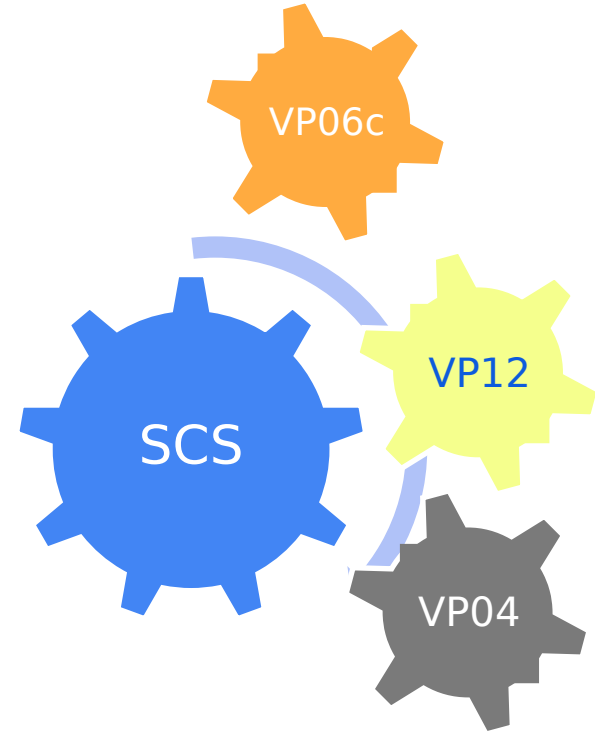
Monitoring of IaaS and KaaS layers

- Integration of alert manager with Matrix chat used by SCS community
- Used in production by both SCS community and dNation: [Docs](#), [Repository](#)

Orange - not urgent, I can go to lunch



**Cooperation with partners we have
met in SCS ecosystem**



Cooperation partners

- During our SCS involvement we have met several companies we have been closely cooperating with



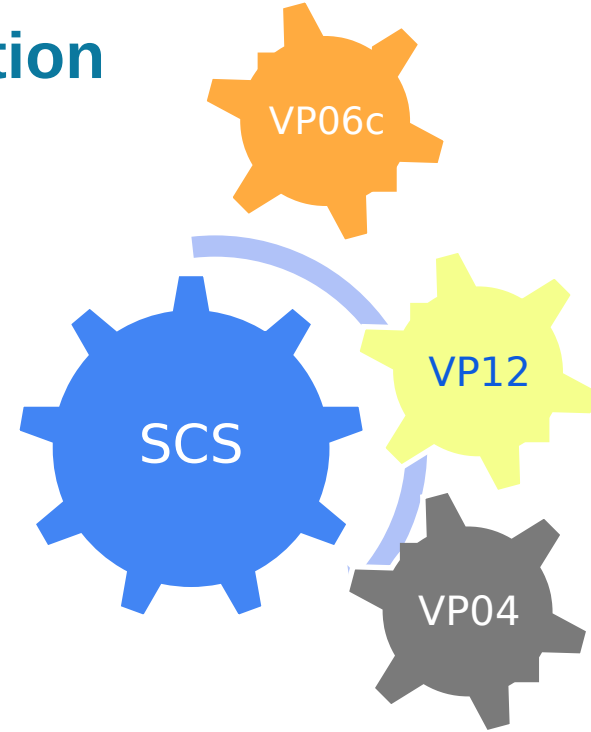
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- We are going to financially support upcoming OSBA SCS Standards Forum body



Thank you for your attention



If you are interested in more details, don't hesitate to talk to me after the presentation