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Getting ready for Science Verification at sweSRC: current setup and future plans

Franz Kirsten
on behalf of sweSRC

swe | SRC

Swiss SKA Days 2026, 31 Aug - 2 Sept 2026, Neuchatel, Switzerland

sweSRC -- who we are



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Kelley Hess



Dejan Vitlacil



Franz Kirsten



Thomas Svedberg



John Conway



Daniel Tafoya



Carmen Toribio



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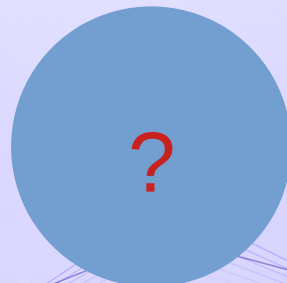
John Conway



Daniel Tafoya

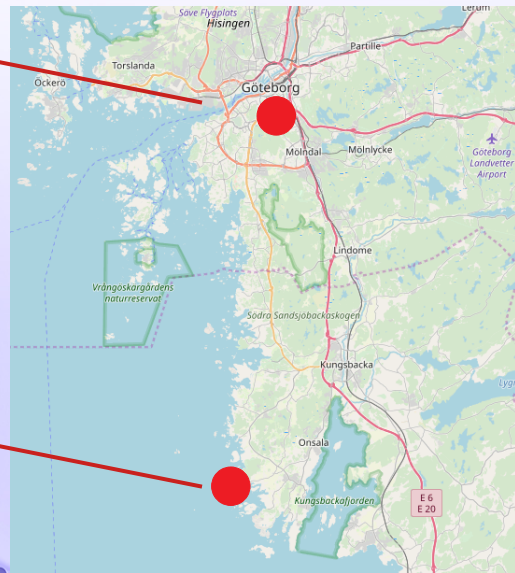
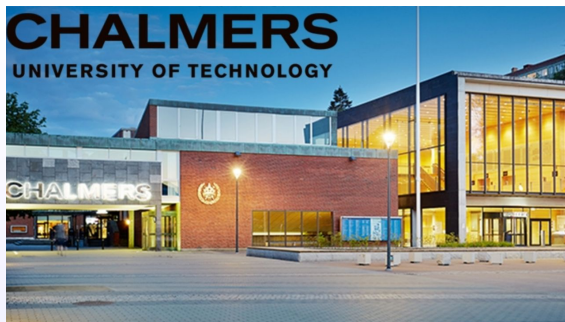


Carmen Toribio



You?
Job add will out soon

sweSRC -- where we are





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sweSRC -- OSO/e-Commons/Chalmers

OSO -- Onsala Space Observatory

- Sweden's National Infrastructure for radio astronomy
- we operate several telescopes: LOFAR, VGOS, 20m dish, 25m dish, VLBI
- we develop & build receivers, e.g. for ALMA, APEX, SKAO
- host the Nordic ARCNode
- support for Swedish radio astronomers
- host sweSRC

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e-commons -- digital research infrastructure

- computing and infrastructure
- storage and data management
- AI and Machine Learning
- research collaboration and expert consultation
- training and education
- **hosts the hardware for sweSRC**



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sweSRC -- our hardware

Seed nodes

2 VMs in Proxmox for deployment

from here we deploy and maintain OpenStack and also the k8s-cluster that runs on VMs in OpenStack

Ceph-Storage

12 storage nodes

provide a total of 1.5 PB of flash storage
1.0 PB are allocated to sweSRC
0.5 PB are for e-Commons usage

provides RBDs as well as CephFS in OpenStack cloud

Production Cluster

3 control panel nodes

Lenovo ThinkSystem SR630 V2
2 x 20 Intel(R) Xeon(R) Silver 4316 CPU
256 GB DDR4
2 x 960GB 6Gbps SATA SSD in a RAID 1 mirror

16 compute nodes

Kaytus K24V2
2 x 32 AMD EPYC 9354 32-Core Processor
1,5TB DDR5 (24 x 64GB)
1x 1.92TB SSD PCIe NVMe

4 compute nodes

Lenovo ThinkSystem SR670 V2
2 x 32 Intel(R) Xeon(R) Platinum 8358 CPU @2.60GHz
512 GB DDR4
1 x 960GB SSD PCIe NVMe
4x NVIDIA Tesla T4 75W (on 1 node)
2x NVIDIA GPU L40S (1 each on two nodes)

Development Cluster

3 control panel nodes

Super Micro servers
2 x 20 Core Intel(R) Xeon(R) Silver 4114
196G RAM
2 x 250G SSD Disks in a RAID 1 mirror

12 compute nodes

Intel servers
2 x 16 Core Intel(R) Xeon(R) Gold CPU 6130
196 GB RAM
1 x 450G SSD Disk



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sweSRC -- our platform(s)

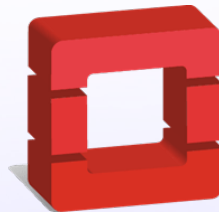
On seed nodes we run:



KOLLA

an OpenStack Community Project

deploys OpenStack



v2024.2 (Dalmatian)

openstack



clusterAPI

deploys k8s inside OpenStack



kubernetes

v1.34.6

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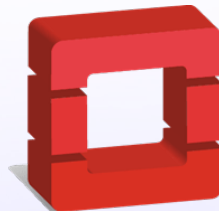
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openstack



clusterAPI

deploys k8s inside OpenStack

currently providing compute via
6 VMs á 32 VCPUs + 512 GB RAM

We can scale this up as needed



kubernetes

v1.34.6

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sweSRC -- SRCNet services that we run



VMs in OpenStack

From seed nodes we deploy via ArgoCD



Argo CD

- Canfar 2026.2
- Jupyterhub
- Soda
- Gatekeeper
- prepareData
- harbor
- harvester



kubernetes

Global registry
(for Canfar)

XrootD
60 TB, Tier-0
provided as RBD

On dedicated nodes

perfonar

XrootD
200 TB, Tier-1
provided as RBD



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sweSRC -- local monitoring

- mostly it's the users that do the monitoring for us
 - E2E as well
- otherwise we have Icinga running on the hypervisors
 - notifications go to local deployment of rocket chat and grafana boards
 - testing Icinga tests on OpenStack kolla containers
- prometheus waits to be deployed on k8s...



Prometheus



Grafana



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sweSRC -- science delivery support

- we are engaged in the Coral team and in Operations
- most DSCs were tested on our infrastructure
- actively contribute to science containers
 - and we run one of the three harbor instances used in SRCNet
- typically we solve issues on an ad hoc basis
 - hard to do otherwise as often SD team does not know what they'll do/need at start of PI
 - but communication with SD folks works very well
 - info gets lost in many many slack messages though



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sweSRC -- service upgrade cycle

- OpenStack + k8s once a year -- first dev then prod (coming up now in September)
 - k8s upgrade could (should?) be done more often, maybe every 6 months
- services when they come out typically, or a few months later
- deployment via argoCD, both on dev and prod
- mostly went with the Swiss approach of having dev/prod overlays and dev/prod branches
 - Updates first tested in dev, then brought to prod
 - “code review” done via if-it-works-it’s-fine
- Once the SKAO release management process is defined, we’ll do our best to follow it



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sweSRC -- future upscaling

- currently we have the resources to fulfill the hardware requirements for SRCNet v0.3
- given sufficient funding we can easily upscale compute and storage in-house
- alternative to in-house one could rent hardware and services (OpenStack, k8s) from the NAISS (National Academic Infrastructure for Supercomputing in Sweden)
 - lot's of pros and cons to consider...
- long term storage solutions (e.g. tape) have not yet been discussed
 - given our share in SKAO (1.5%) might not host a long term archive anyway



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sweSRC -- to-do's

- upgrade OpenStack
- replace current “user storage” in Canfar by CephFS-backend (currently RBD)
 - potentially rethink our T0-/user storage setup
 - increase size of user storage
- bring GPUs back online, provision GPU-VMs
- separate service and compute VMs (aka k8s-nodes), GPU-VMs, large RAM-VMs
- make our 15 additional HPC-nodes available to SRCNet, including storage



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Thank you!

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