The Swiss Academic Community powered through OpenStack

SWITCH

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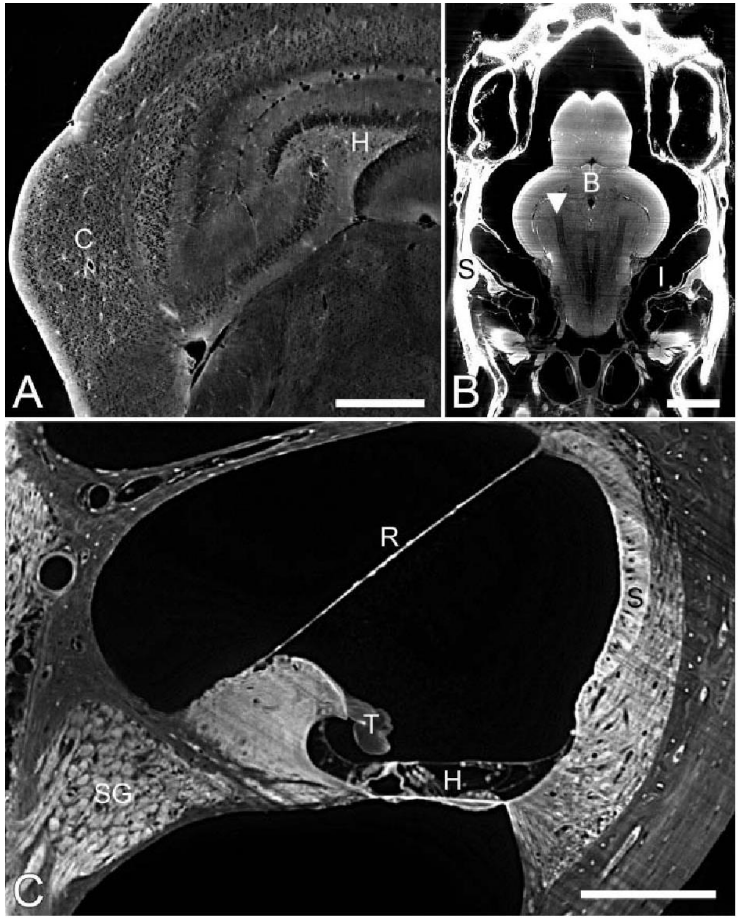
CERN OpenstackDays, 2019-05-27

http://flickr.com/photos/glennharper/49536169/



https://www.semanticscholar.org/paper/Light-sheet-fluorescence-microscopy%3A-a-review.-Santi/9c6087d7f7637c45435b0c1595121771addf9e6a/figure/4

Laser Microscopic Image of Mouse Brain

0.5 TB of data per brain

3 brains imaged per week per microscope

Maybe 120 brains per year

60 TB of brain data per year

Accessible for future researchers over for multiple years

Please!

NO MORE BRAINS IN THIS SINK!!!

Please use the disposal container in the Tissue Cyte room!

Thank you!

SWITCH

Mission

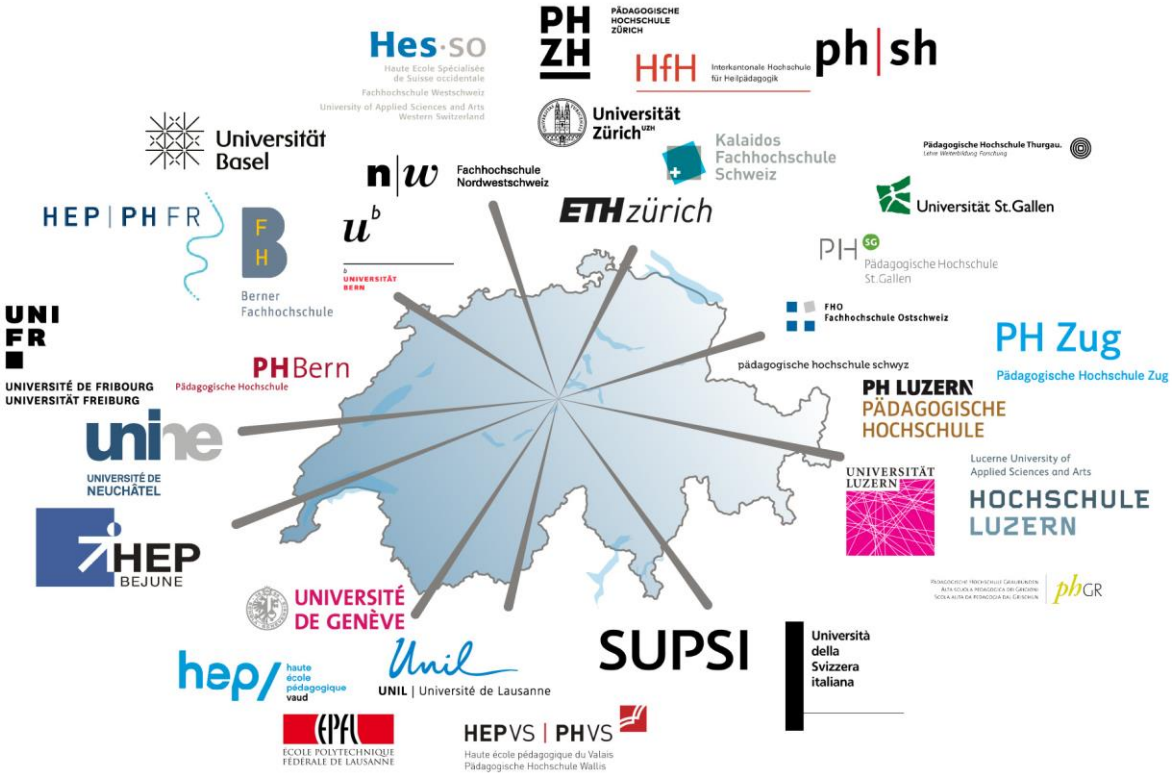
SWITCH is an **integral part of the Swiss academic community**.

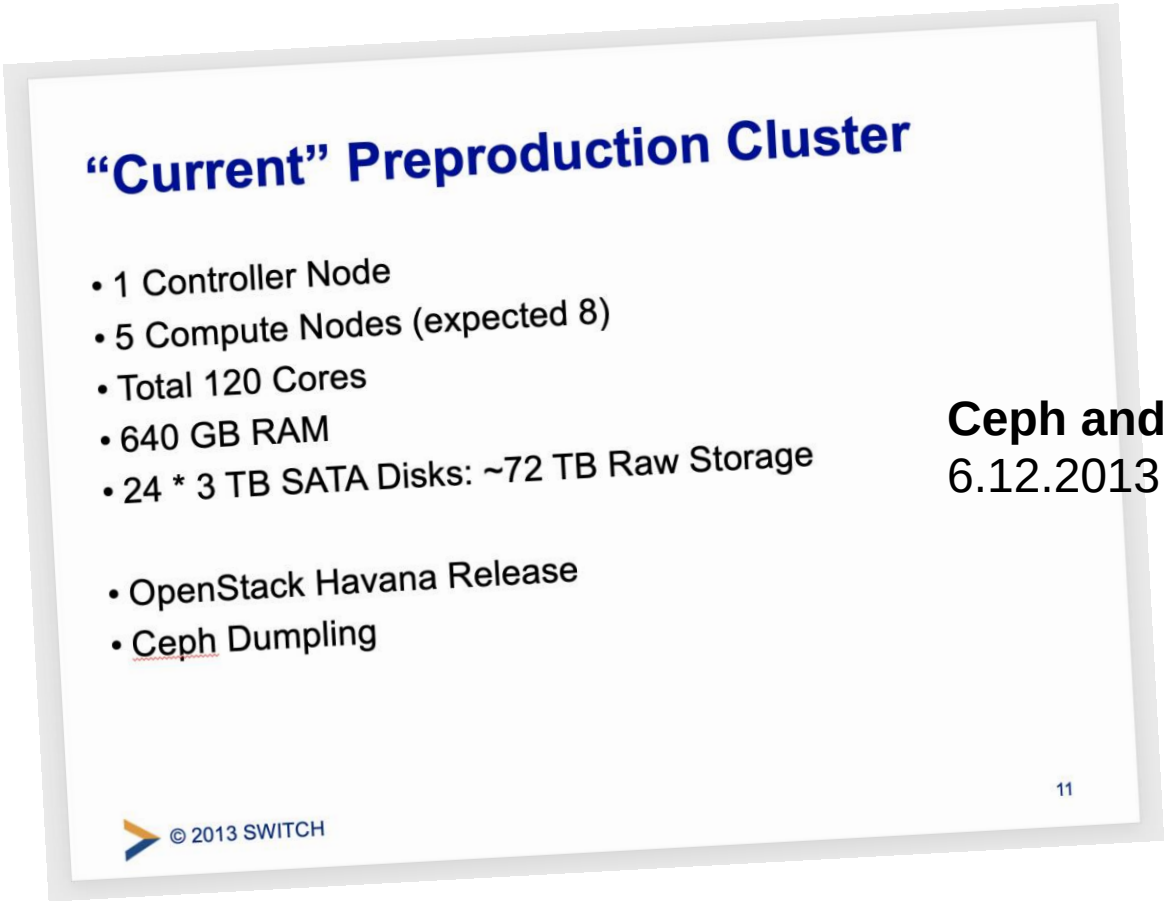
Based on our **core competencies**

- Network
- Security
- Identity Management

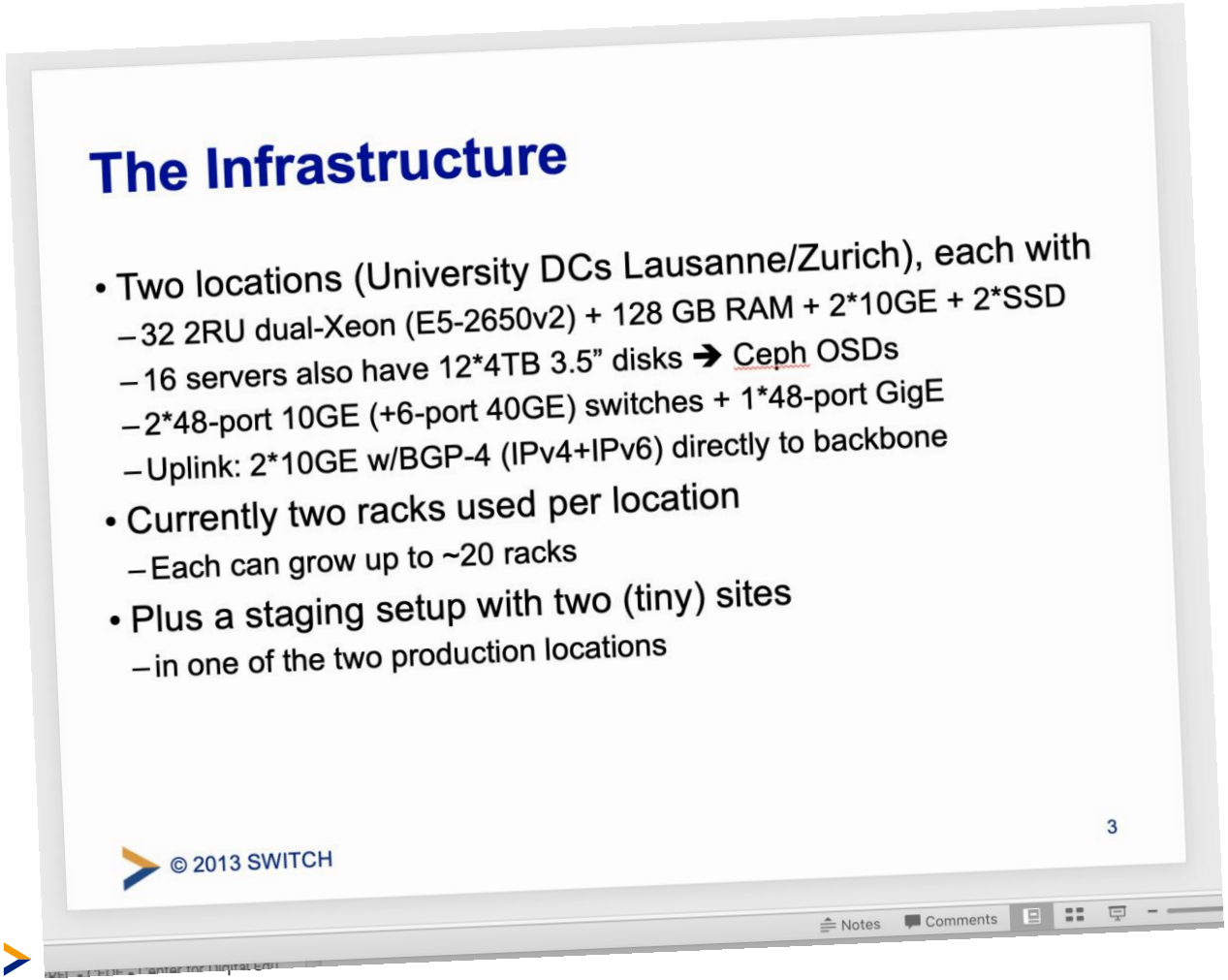
SWITCH offers collaboratively developed ICT solutions that empower users in and beyond the academic world to achieve leading edge results in a globally competitive environment.

Academic community Switzerland





Ceph and Openstack at SWITCH
6.12.2013 @ CERN

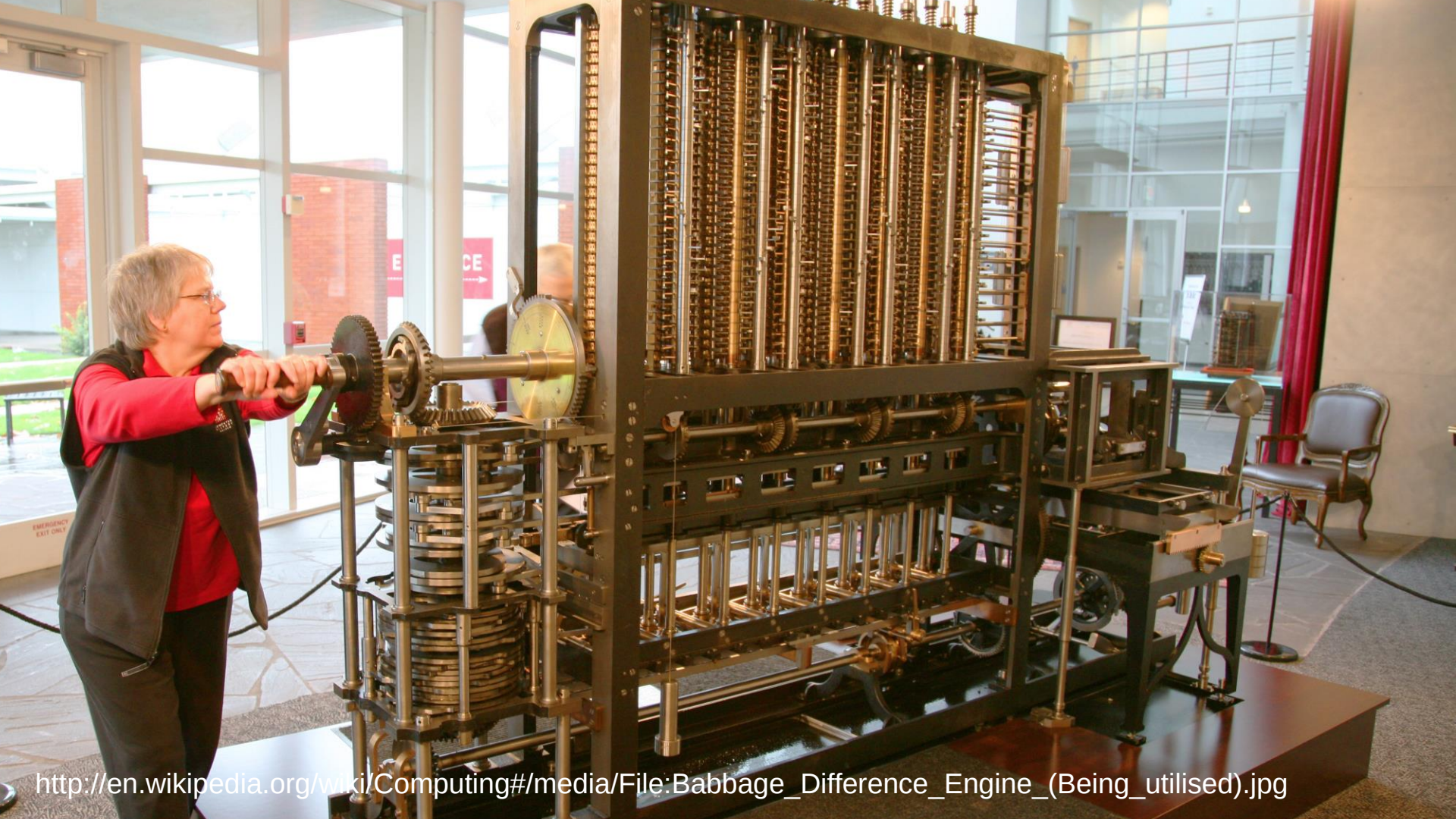


Storage
1280 TB raw

Compute
448 Cores
3.5 TB RAM

Now

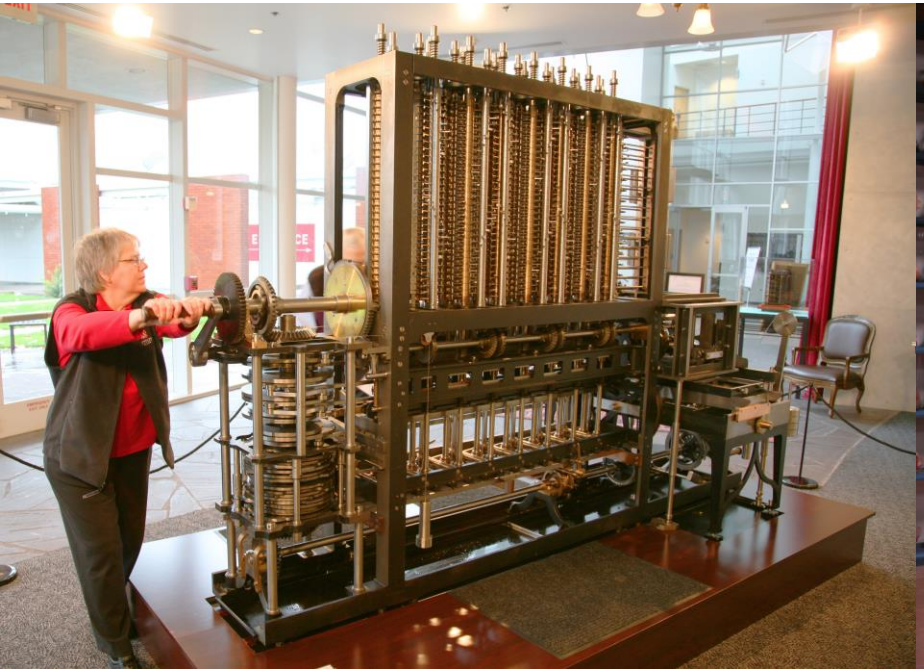
Physical servers:	~ **400**
CPU cores:	**3748** (physical cores)
Memory:	~ **30** TB
Storage:	~ **10** PB (Ceph SATA) / ~ 1300 Disks ~ **100** TB (Ceph SSD) / 50 NVMe
GPU:	**8** Titan XP **16** T4 **34** P100
Network:	**26** Cumulus Linux 40 & 100Gbs switches Dual 10 Gbs; upgrading to 100 Gbs (Q2 2019) L2 tunnel to campus networks (VPC)

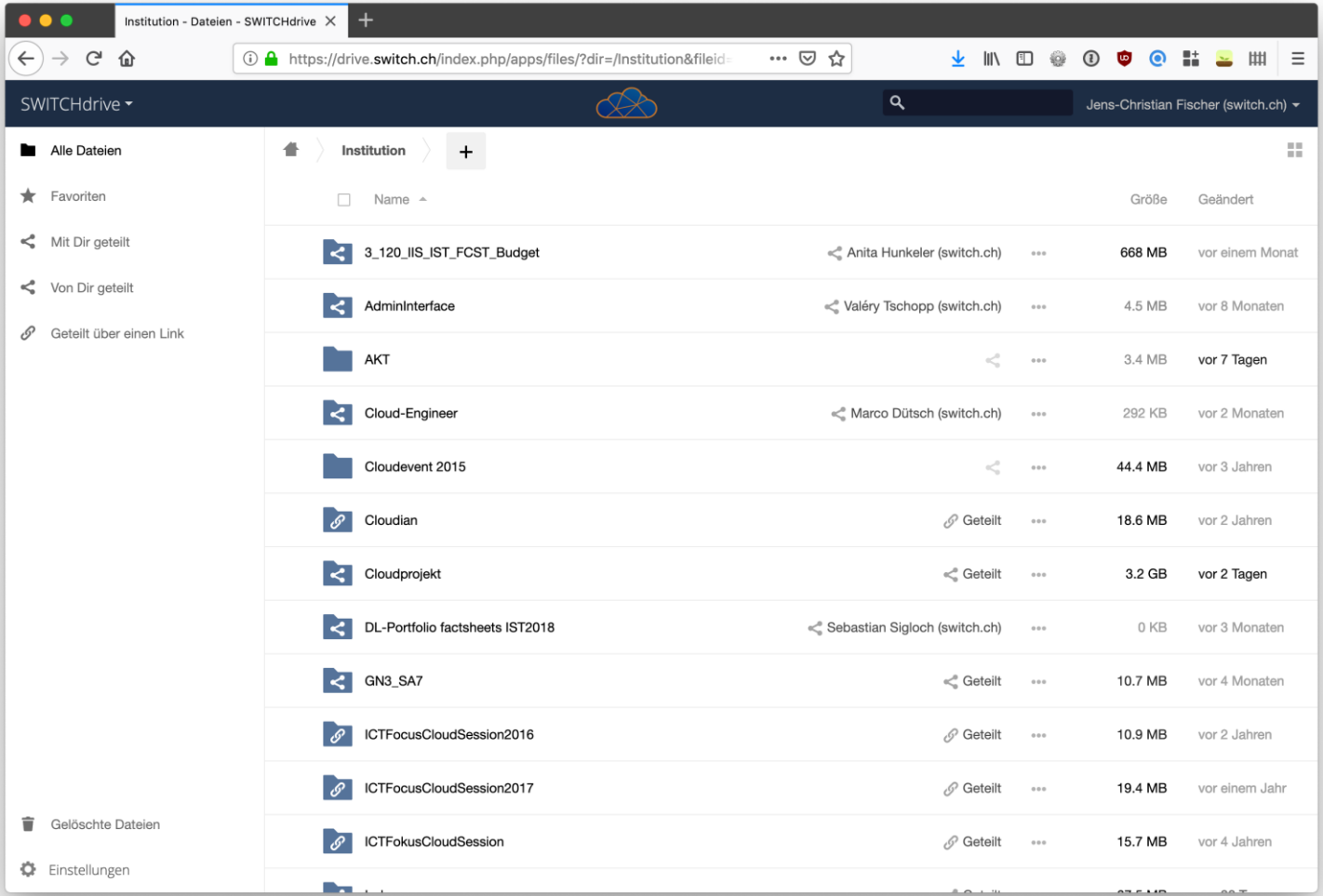


http://en.wikipedia.org/wiki/Computing#/media/File:Babbage_Difference_Engine_(Being_utilised).jpg

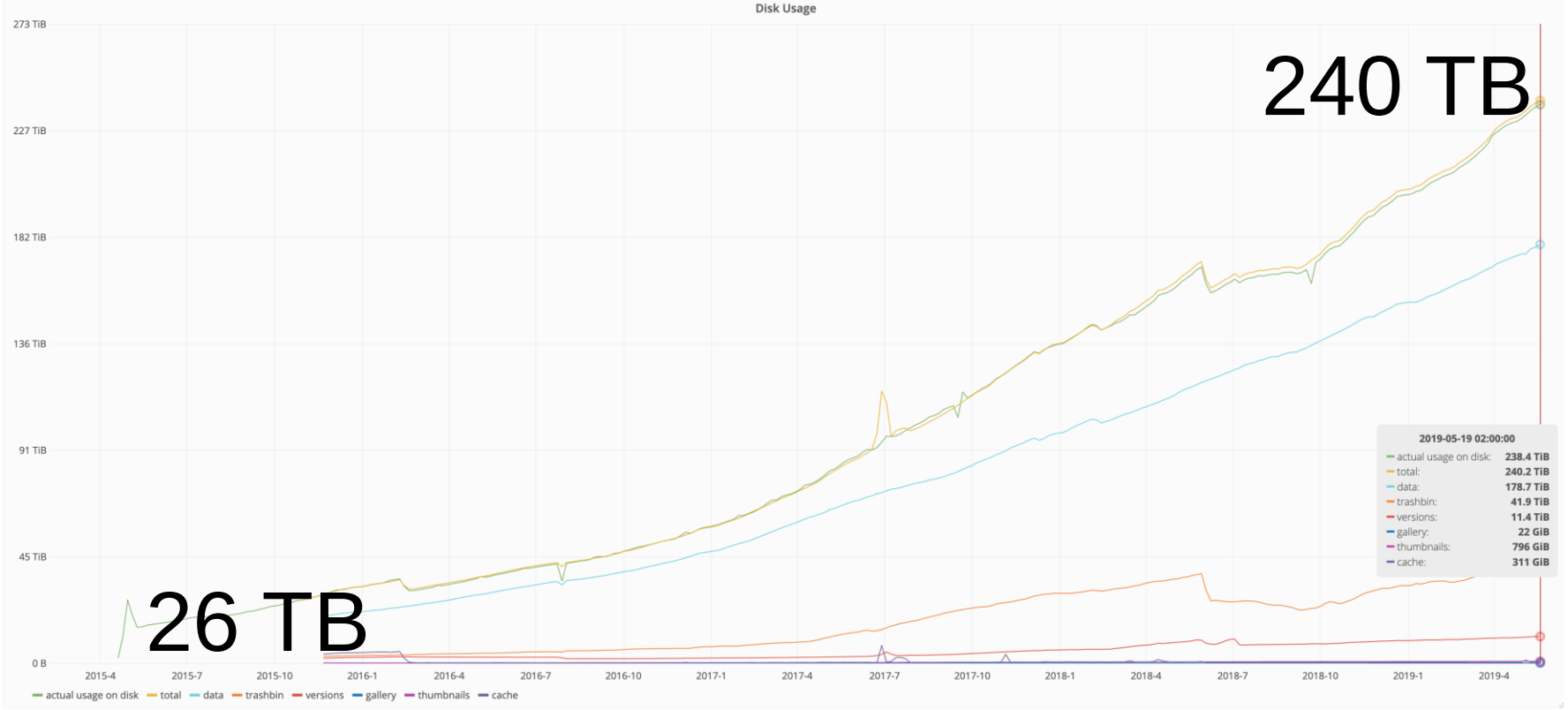
https://commons.wikimedia.org/wiki/File:Storage_Gallery.jpg

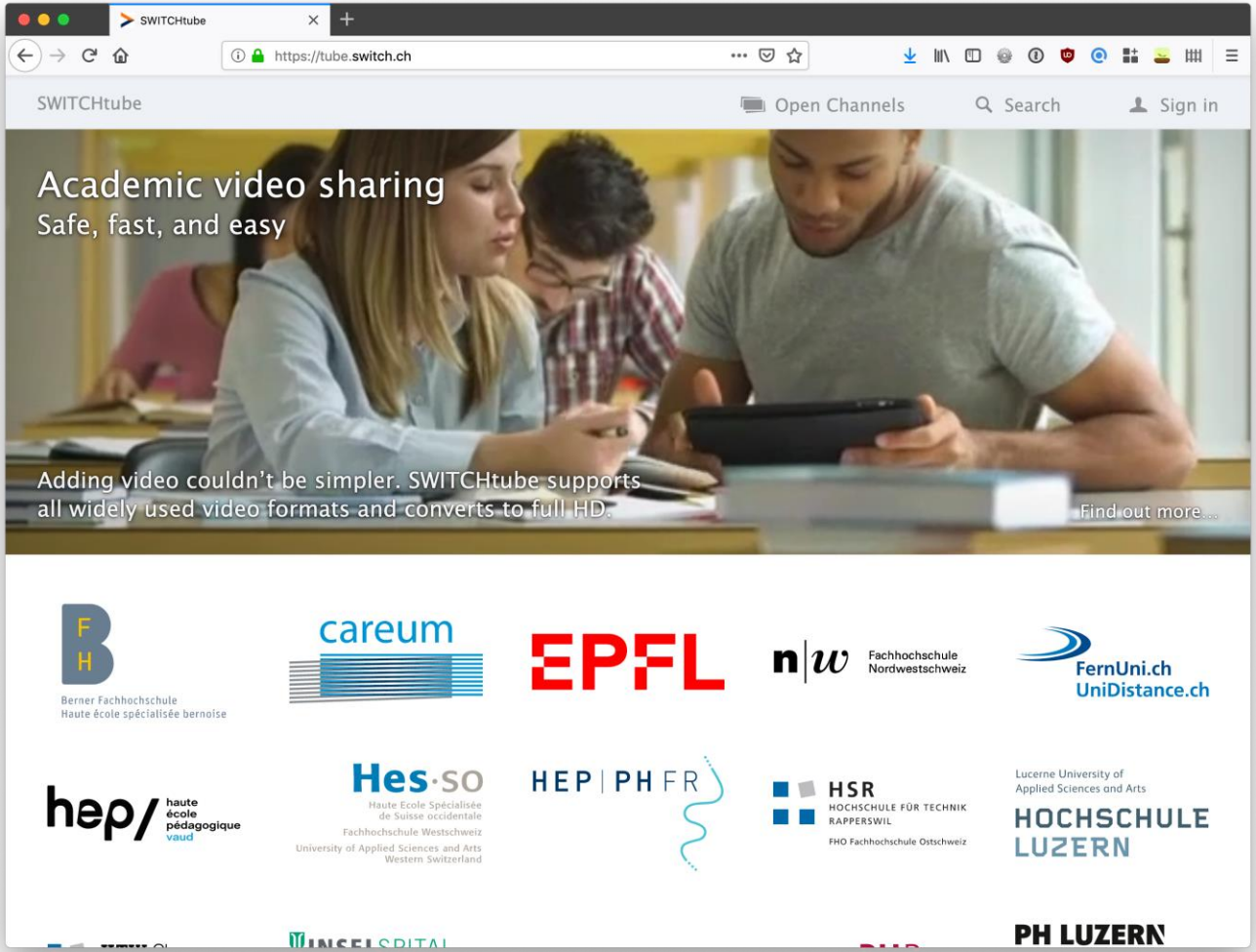
Compute & Storage

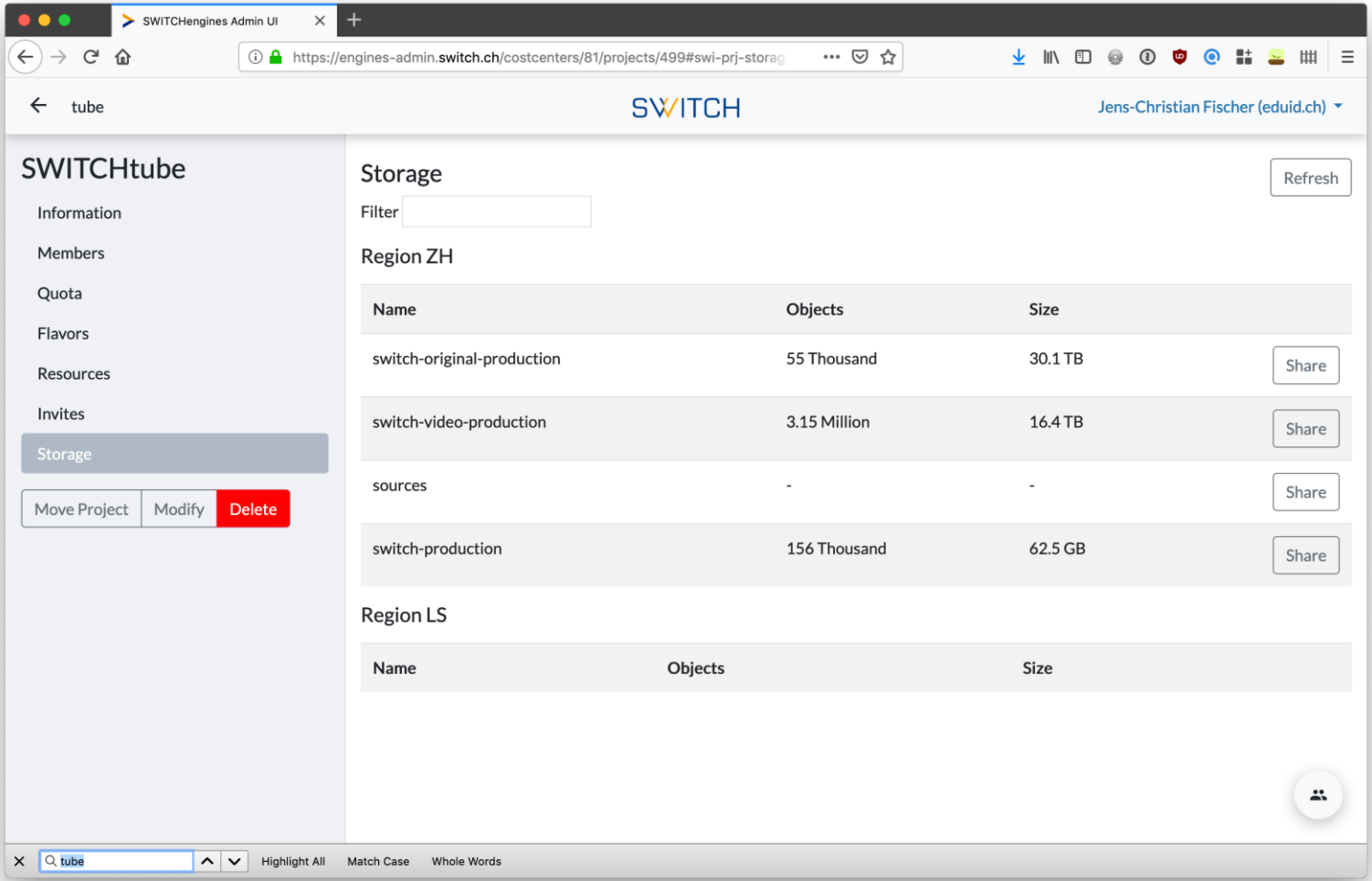



Institution - Dateien - SWITCHdrive
https://drive.switch.ch/index.php/apps/files/?dir=/Institution&fileid=
SWITCHdrive
Jens-Christian Fischer (switch.ch)
Alle Dateien
Favoriten
Mit Dir geteilt
Von Dir geteilt
Geteilt über einen Link
Gelöschte Dateien
Einstellungen
Institution
Name
Größe
Geändert
3_120_IIS_IST_FCST_Budget
Anita Hunkeler (switch.ch)
668 MB
vor einem Monat
AdminInterface
Valéry Tschopp (switch.ch)
4.5 MB
vor 8 Monaten
AKT
3.4 MB
vor 7 Tagen
Cloud-Engineer
Marco Dütsch (switch.ch)
292 KB
vor 2 Monaten
Cloudevent 2015
44.4 MB
vor 3 Jahren
Cloudian
Geteilt
18.6 MB
vor 2 Jahren
Cloudprojekt
Geteilt
3.2 GB
vor 2 Tagen
DL-Portfolio factsheets IST2018
Sebastian Sigloch (switch.ch)
0 KB
vor 3 Monaten
GN3_SA7
Geteilt
10.7 MB
vor 4 Monaten
ICTFocusCloudSession2016
Geteilt
10.9 MB
vor 2 Jahren
ICTFocusCloudSession2017
Geteilt
19.4 MB
vor einem Jahr
ICTFokusCloudSession
Geteilt
15.7 MB
vor 4 Jahren

SWITCHdrive




SWITCHtube
https://tube.switch.ch
SWITCHtube
Open Channels
Search
Sign in
Academic video sharing
Safe, fast, and easy
Adding video couldn't be simpler. SWITCHtube supports all widely used video formats and converts to full HD.
Find out more...
Berner Fachhochschule
Haute école spécialisée bernoise
careum
EPFL
Fachhochschule Nordwestschweiz
FernUni.ch
UniDistance.ch
haute école pédagogique vaud
Hes·so
Haute Ecole Spécialisée de Suisse occidentale
Fachhochschule Westschweiz
University of Applied Sciences and Arts Western Switzerland
HEP | PH FR
HSR
HOCHSCHULE FÜR TECHNIK RAPPERSWIL
FHO Fachhochschule Ostschweiz
Lucerne University of Applied Sciences and Arts
HOCHSCHULE LUZERN
PH LUZERN


SWITCHengines Admin UI
https://engines-admin.switch.ch/costcenters/81/projects/499#swi-prj-storag
tube
SWITCH
Jens-Christian Fischer (eduid.ch)
SWITCHtube
Information
Members
Quota
Flavors
Resources
Invites
Storage
Move Project
Modify
Delete
Storage
Refresh
Filter
Region ZH
Name
Objects
Size
switch-original-production
55 Thousand
30.1 TB
Share
switch-video-production
3.15 Million
16.4 TB
Share
sources
-
-
Share
switch-production
156 Thousand
62.5 GB
Share
Region LS
Name
Objects
Size
tube
Highlight All
Match Case
Whole Words

Education

- Around 600 Openstack Tenants for just one university
- Tooling for mass provisioning of projects / users
- ”Education flavors” for cost savings

https://datascience.ch/

ACE-DATA: Antarctic Circumnavigation Expedition – Delivering Added value To Antarctica

https://datascience.ch/ace-data-antarctic-circumnavigation-expedition-delivering-added-value-to-antarctica/

Use Cases

- Reproducible research & national projects
- Research / simulations
- Education (Network, Server Management, Genome Sequencing, Master Thesis Resources)
- Backup [of Backups]
- Moving “Enterprise” workloads to the cloud

Real Challenges

- Project / User Provisioning
- User Interface
- Rating / Charging / Billing

Solution:

Write our own software on top of OpenStack / Ceph

(cc) https://flickr.com/photos/58411470@N00/5315386347

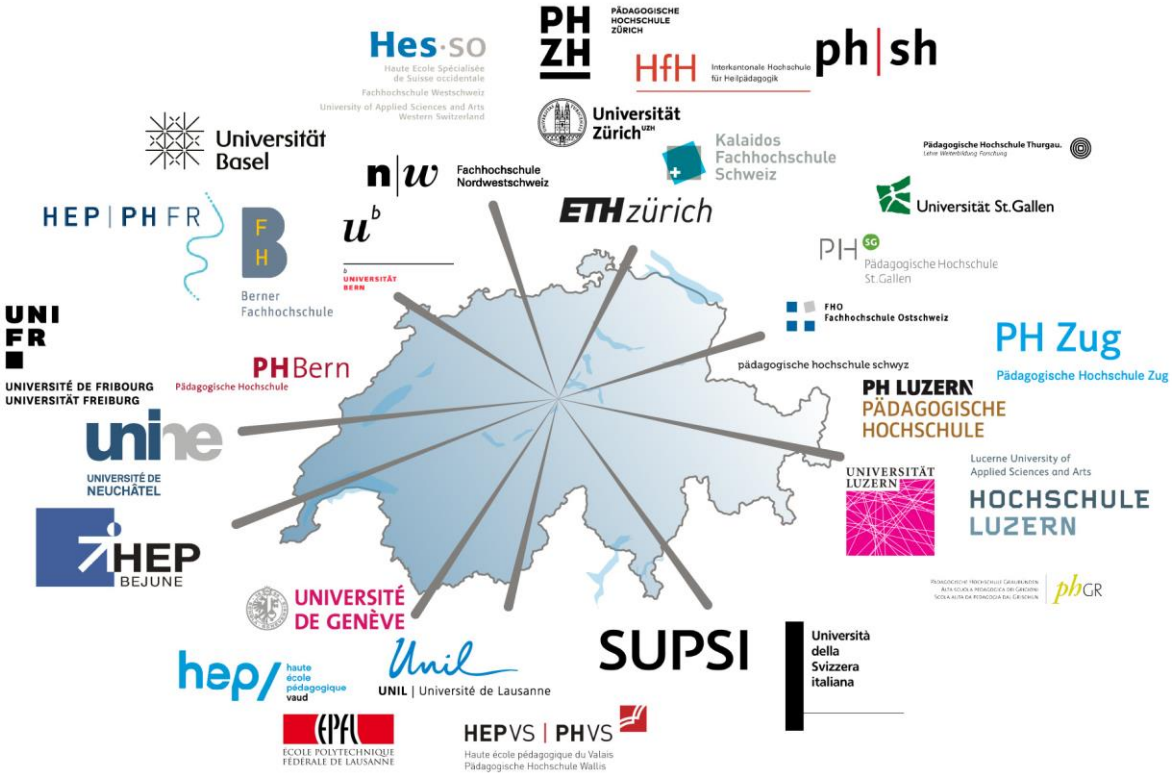
Deployment Models:

…

Community cloud. The cloud infrastructure is provisioned for exclusive use by a specific community of consumers from organizations that have shared concerns (e.g., mission, security requirements, policy, and compliance considerations). It may be owned, managed, and operated by one or more of the organizations in the community, a third party, or some combination of them, and it may exist on or off premises.

Source: NIST Definition of Cloud Computing, SP 800-145

Academic community Switzerland



International cooperations

Security

APWG www.apwg.org
FIRST
enisa
DNS-OARC
CERT.at
EUROPOL
TF-CSIRT
TEAM CYMRU

Trust & Identity

REFEDS
Shibboleth
SIRTFI
GÉANT
eduGAIN

Network

IEEE
IETF
GÉANT
RIPE NCC

Infrastructure & Data Services

DIGITAL INFRASTRUCTURES for RESEARCH 2017
FIWARE
GO FAIR
GÉANT
openstack
HELIX NEBULA THE SCIENCE CLOUD
e-IRG e-Infrastructure Reflection Group

Digital Solutions & Coordination

ZKI Zentren für Kommunikation und Informationsverarbeitung e.V.
INTERNET2
deutsches forschungsnetz DFN
The Lighthouse Alliance
eduserv
Cloud Forum by Cornell University
Arge Software
GÉANT
SURF
EDUCAUSE
slbdiensten

More

ICANN
ZKI Zentren für Kommunikation und Informationsverarbeitung e.V.
centr
GÉANT
Arge Software
SURF
EDUCAUSE
Domain pulse

Communities (1)

- OpenStack / OpenInfra
  - Summits, Ops Meetups, PTG
  - Code review, bug reports, (few) code contributions
  - Respond to survey, moderate ops sessions, User Committee…

Communities (2)—Think Globally, Act Locally

- Swiss Openstack User Group Meetup
- Openstack Operator – bi-weekly Videochat (since Feb 2015)
- Openstack Operators Slack Channel

→SIG-CISS (“Special Interest Group on Cloudy Interoperable Software Stacks”) under the GÉANT Community Programme (GCP)

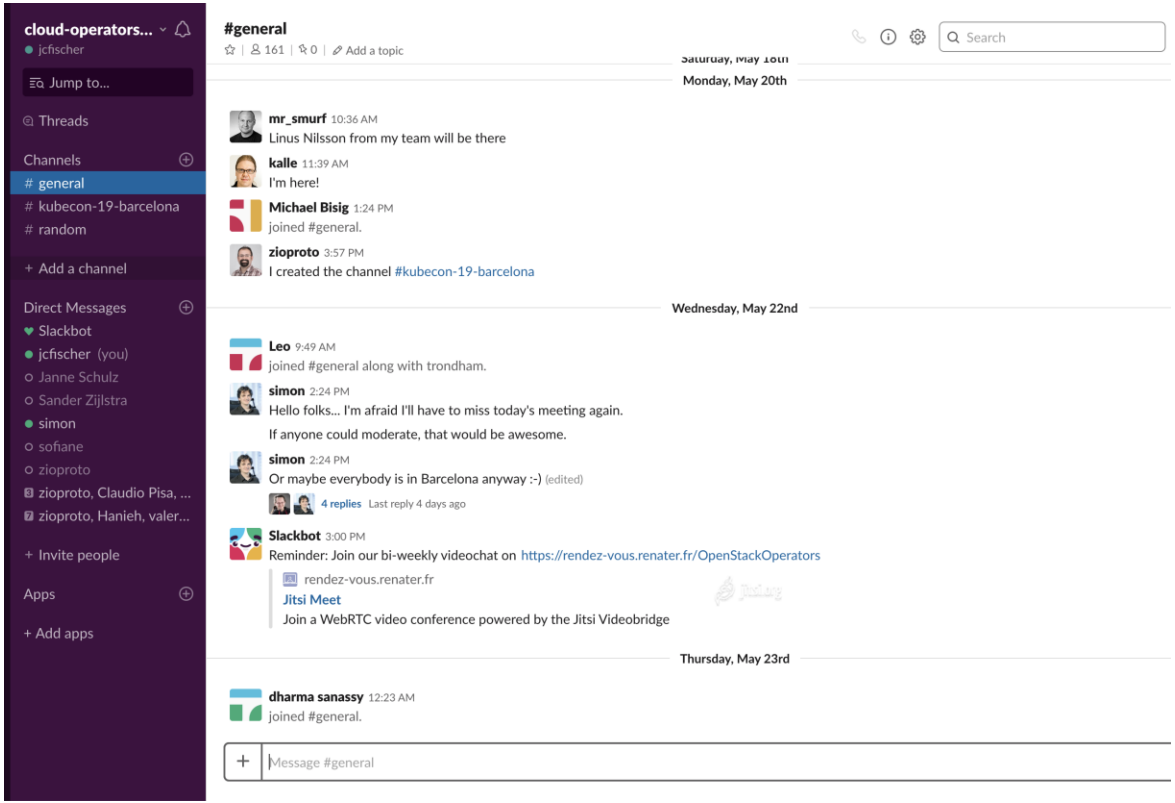
  - meeting here @Cern later this week

https://swit.ch/OSO

- 2016-03-04: https://sandstorm.cloud.switch.ch/shared/Si6rY57hZ4xI_jIO_8-efQPDfytAE97uD_zaFyihJX2 (various small topics)
- 2016-02-19: https://sandstorm.cloud.switch.ch/shared/dGHL74oCHxRXLi5s1Cb6ZXuPdRFHyoHE7PwhqRTOxq4 (Report from
- 2016-02-05: https://sandstorm.cloud.switch.ch/shared/LImaX_OmHhEDCYmDrJmw8hbDJWsOB9FVuGpQwjsli5S (Feedback o
- 2016-01-08: https://sandstorm.cloud.switch.ch/shared/Cz98BigeBNThD3WP3QKCK0utpObBYL7dOxe2fODj3Dr (Workshop, va
- 2015-12-11: https://sandstorm.cloud.switch.ch/shared/jII4KZ-Yx-m8QduGHPCnHmlKPbU3HOt-JBaxt6u3zhi (Federated Identit
- 2015-11-27: https://sandstorm.cloud.switch.ch/shared/ySB6lEqA-hkJjxZSt_g7i0fvR7CK1L_S-KUU30DufgA (Ops midcycle, Aca
- 2015-11-13: https://sandstorm.cloud.switch.ch/shared/4nuyeJIDMkDwrA7MX6AJcgbNHSi8pzZhY2iIEBUIDYv (Various small to
  /d/1MNtrFs2pCx6PgPMwjq7waghab_ta6YtSgBejqYp7bY0/edit
- 2015-10-30: https://sandstorm.cloud.switch.ch/shared/Ya8iwbd9uw-anxdjeFajaAlkN918Yr5NYt5y93h9RF0 (OpenStack wishlis
- 2015-10-16: https://sandstorm.cloud.switch.ch/shared/_B7BIG1R5xpwi1yTrCrB_zGi2rYqQK7gvlS7n5hlVM4 (Performance)https
- 2015-10-02: https://sandstorm.cloud.switch.ch/shared/elhO-wXUxRALN1BGDNFE8_EjtBdRBSM1lBtl6vlgBHg (Cloud Manager
- 2015-09-18: https://sandstorm.cloud.switch.ch/shared/jdzb2nR0Qe2flWF2Uvrr569cbejVSqKqODCIDL8ePRz (Liberty preview)
- 2015-09-04: https://sandstorm.cloud.switch.ch/shared/H4ktBWsVecKpRbCoZQQSU4tJbI7fceP4X-cOug5guvv (New Horizon U
- 2015-08-21: https://sandstorm.cloud.switch.ch/shared/O1k6ckA2e7Dj8MU5uRmyQxRleFdNAkPlt8E6_G6pjU_ (various small to
- 2015-08-07: https://sandstorm.cloud.switch.ch/shared/cTH125vsdJZKtH909pI-dTZXq9Mpjh_OVt590ZGOQa6 (HEAnet OpenSt
- 2015-07-24: https://sandstorm.cloud.switch.ch/shared/M3xa5w3HgWO0lUu9oSKYRucSwqeohM7gKNJhVwiC4EY (Upcoming
- 2015-07-10: https://sandstorm.cloud.switch.ch/shared/5WdNWiI94-hcvhJFQnHpVH2lLnxdRyiiiWR13ULpLSD (GÉANT Testbed
- 2015-06-26: https://sandstorm.cloud.switch.ch/shared/EJrITfCZ6yvFo2CkxHnqIrBtXb3R_i9WMYneh8Jff-q (Upgrades)
- 2015-05-29: https://sandstorm.cloud.switch.ch/shared/zWuNj0c85lR91mKO_EuyUmHtFycFF2yx4tXyUGcDytq (Vancouver Ope
- 2015-03-20: https://sandstorm.cloud.switch.ch/grain/HfhrqZtvQZvgPxiNrSi4NE (Nordic Cloud, CLASSe)
- 2015-03-06: https://sandstorm.cloud.switch.ch/grain/ZSLuBRgpBkG2yxBezYv85N (Live migration & many small topics)
- 2015-02-20: https://sandstorm.cloud.switch.ch/grain/cA667kJiAw5uvZXs2zM9HW (introductions & brainstorming)

Special events

Openstack Operators Slack



https://cloud-operators-ch.slack.com

IT 4 Research Day

- Speakers from the academic community
- September 2019 @ University of Fribourg

- Input from Ed Bugnion, EPFL at first IT4RD led to development of LTS

User Community

- Various more or less known tools
  - https://forum.cloud.switch.ch
  - https://cloudblog.switch.ch/
  - @SWITCHengines

Consistent tools & Engagement

Announcing a new user centric cloud community

- Helping users get the most out of cloud (SWITCHengines and commercial clouds)

- Bringing our various tools together
- Creating new contents (Documents, Templates, Webinars)
- Dedicated Community Manager

For science
For research
For education

http://flickr.com/photos/glennharper/49536169/

SWITCH

Working for a better digital world