

Operating an OpenStack Cloud

Learning from building & operating SWITCHengines



SWITCH

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SWITCH

- Non Profit Foundation
- IT Services for Universities and Higher Education
 - Traditional Internet (SWITCHlan)
 - Federated Single Sign On (SWITCHaai)
 - Lecture Recording & Videos (SWITCHcast / SWITCHtube)
 - Many, many more
- A partner to Academia
- Registry for .ch (since 1987)
- And Domain registration until 2015

SWITCH Services

- Established services:
 - Network
 - Authentication and authorization infrastructure
PKI, SWITCHham, SMS, videoconf
 - Security
 - Collaboration, e-learning services
- New(er) services:
 - Procurement
 - Cloud services
- Under development:
 - Swiss edu-ID, Information Security Management (ISMS)



“Cloud”

- Infrastructure as a Service
 - SWITCHengines
- Software as a Service
 - SWITCHdrive – an Academic Sync & Share Service
 - SWITCHfilesender – overcome the 10 MB Mailbox limit
 - SWITCHcast – record and edit lectures
 - SWITCHtube – a secure video distribution tool

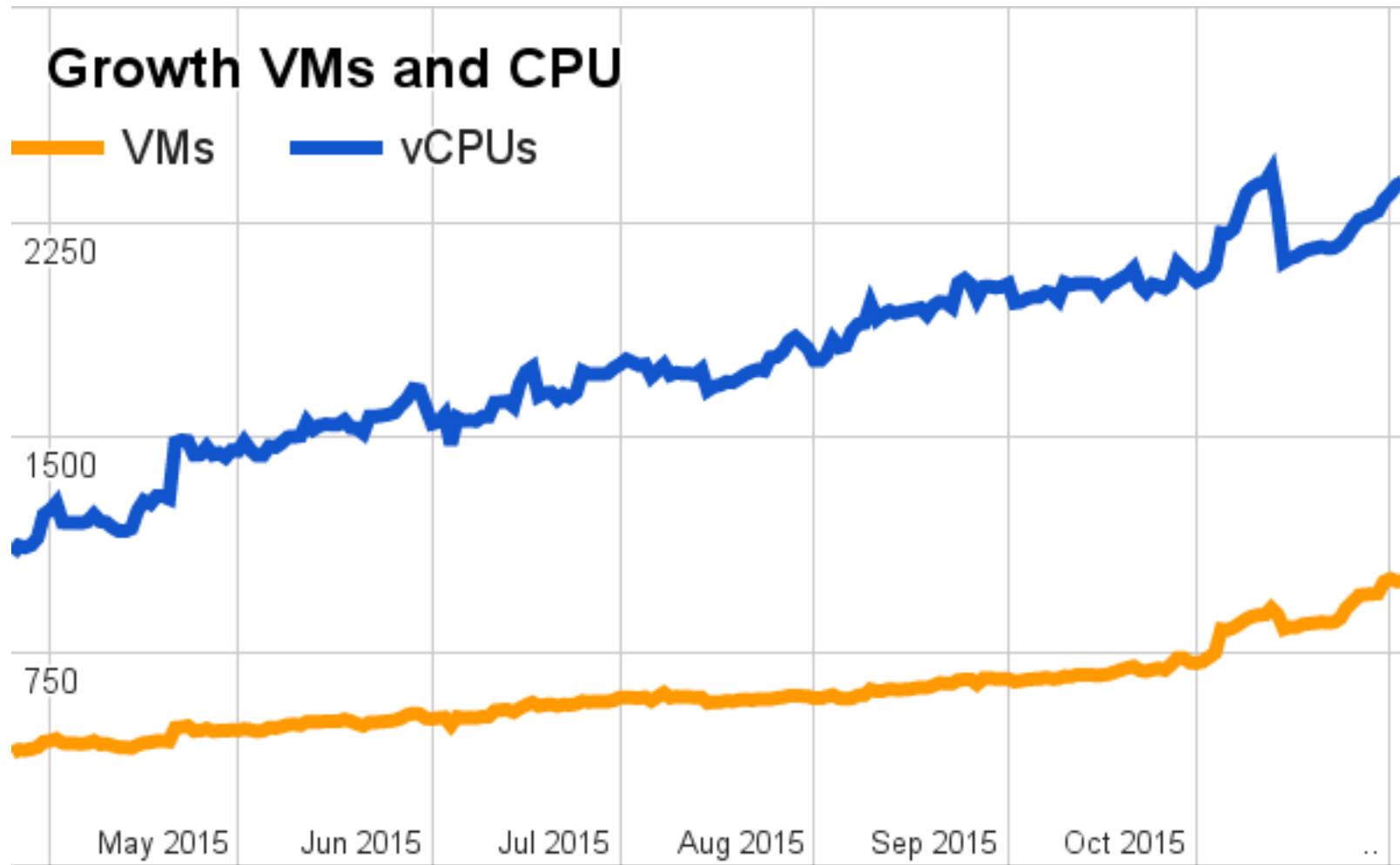
Timeline for IaaS Cloud Offering

- 2012: Start of Project BCC – Building Cloud Competency
- 2013: Decision that SWITCH builds Swiss Academic Cloud services
- 2014: SCALE project. One of the deliverables – build an initial cloud infrastructure - 64 Servers purchased and installed
- 2015: Pilot usage with production load. End of SCALE project
Start of SCALE-UP project
- 2016: SWITCHengines – an official SWITCH service
- 2017: End of SCALE-UP project

Current Status

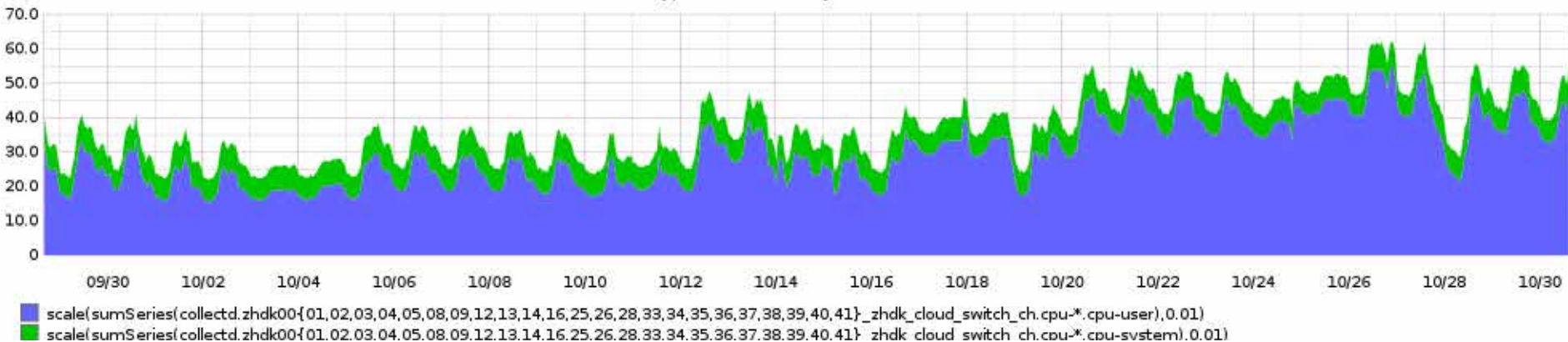
- SWITCHengines has been in “public beta” and “internal production” since December 2014
- Several SWITCH services run on it (SWITCHdrive, SWITCHengines, SWITCHfilesender, SWITCHtube)
- Over 630 individual users and around 40 research projects online
- Around 1000 VMs running on the cloud right now (2200 cores, 3700 GB RAM, 360 TB of storage allocated)
- Over 60'000 VMs have been created / decommissioned since the beginning

Cloud Usage

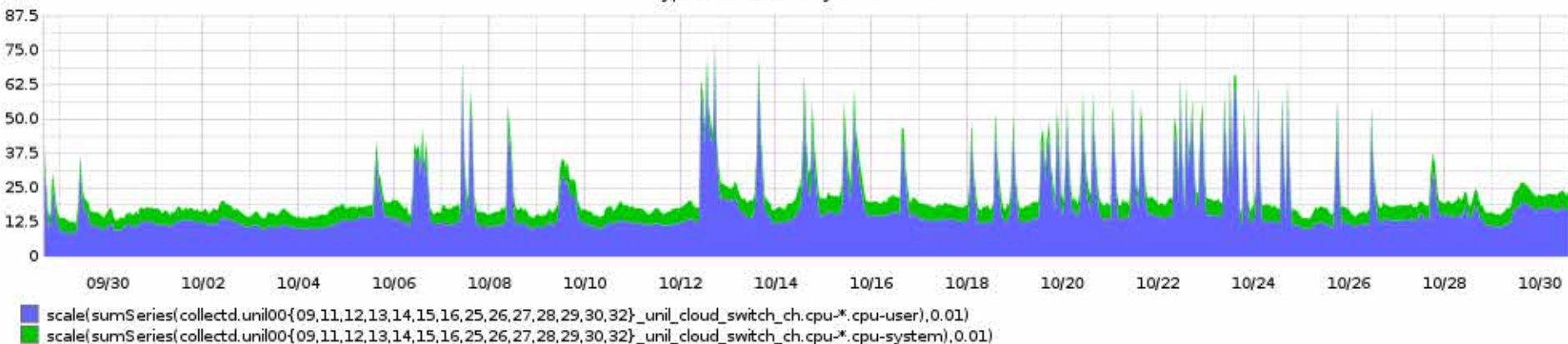


Cloud Usage

Hypervisor User/System CPU



Hypervisor User/System CPU



Expansion under way

- Double the number of compute nodes (and increase the number of CPUs by 150% - Moore's Law at Work)
 - 2000 CPU cores
- Increase the storage capacity by 50%
 - 2.25 PB raw storage
- Online end of 2015

Building



Hardware is easy

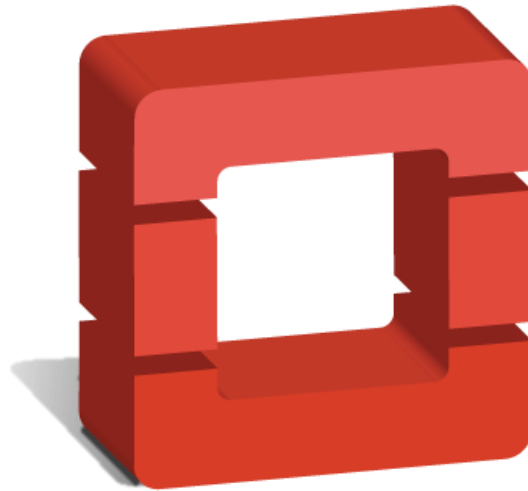
- Commercial Off the Shelf
- “Low Cost, Medium Performance” (but lots of it)

Building SWITCHengines



- 2 Geographic Locations
 - ZHdK
 - UNIL
- 32 Storage Nodes
 - 384 4TB SATA Disks (and a bunch of SSDs for Journals)
 - 1.5 PB RAW Storage
- 41 Compute Nodes
 - 1240 Cores
 - 9.2 TB RAM

Software



openstack™
CLOUD SOFTWARE

But wait, there's more

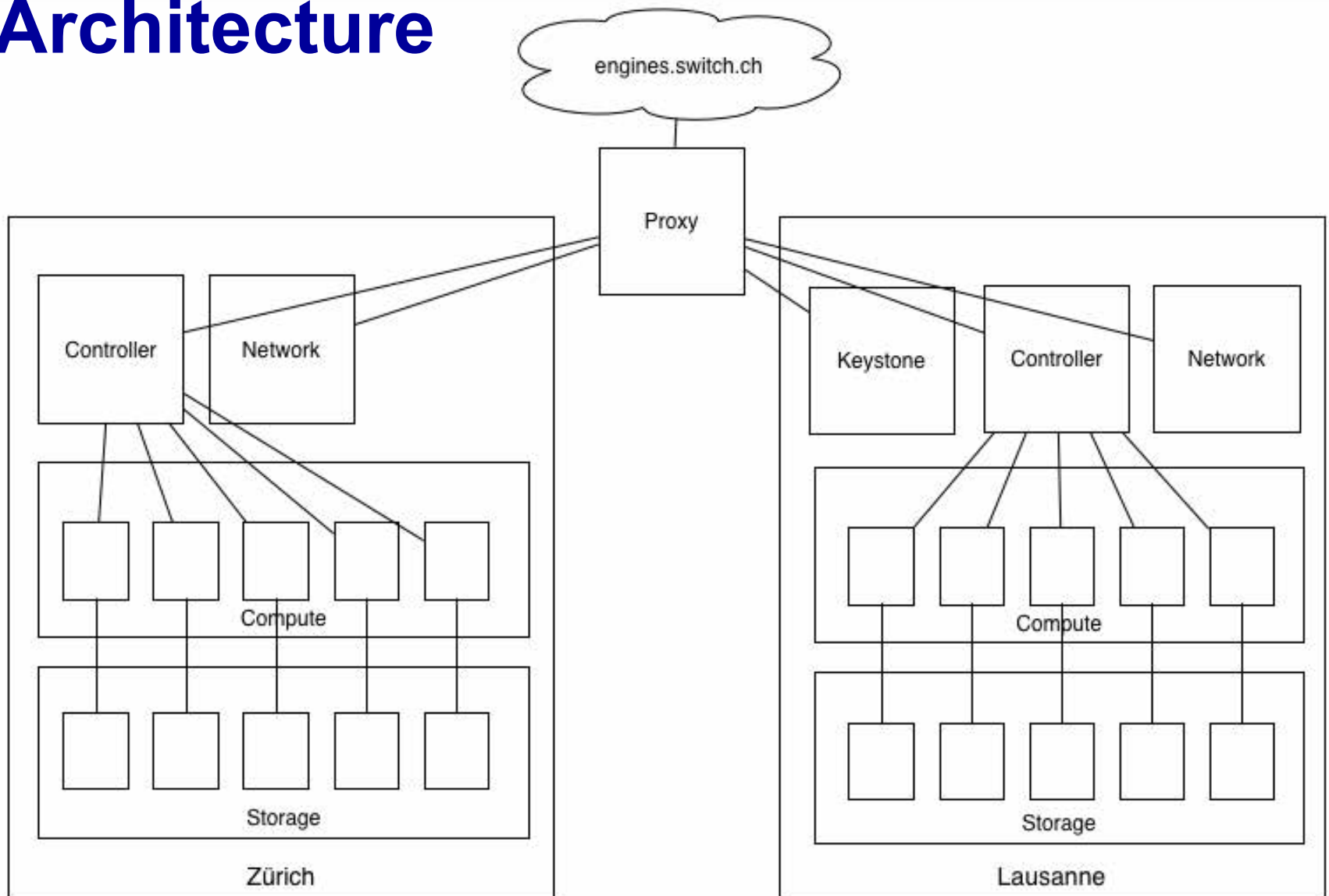


Nagios®

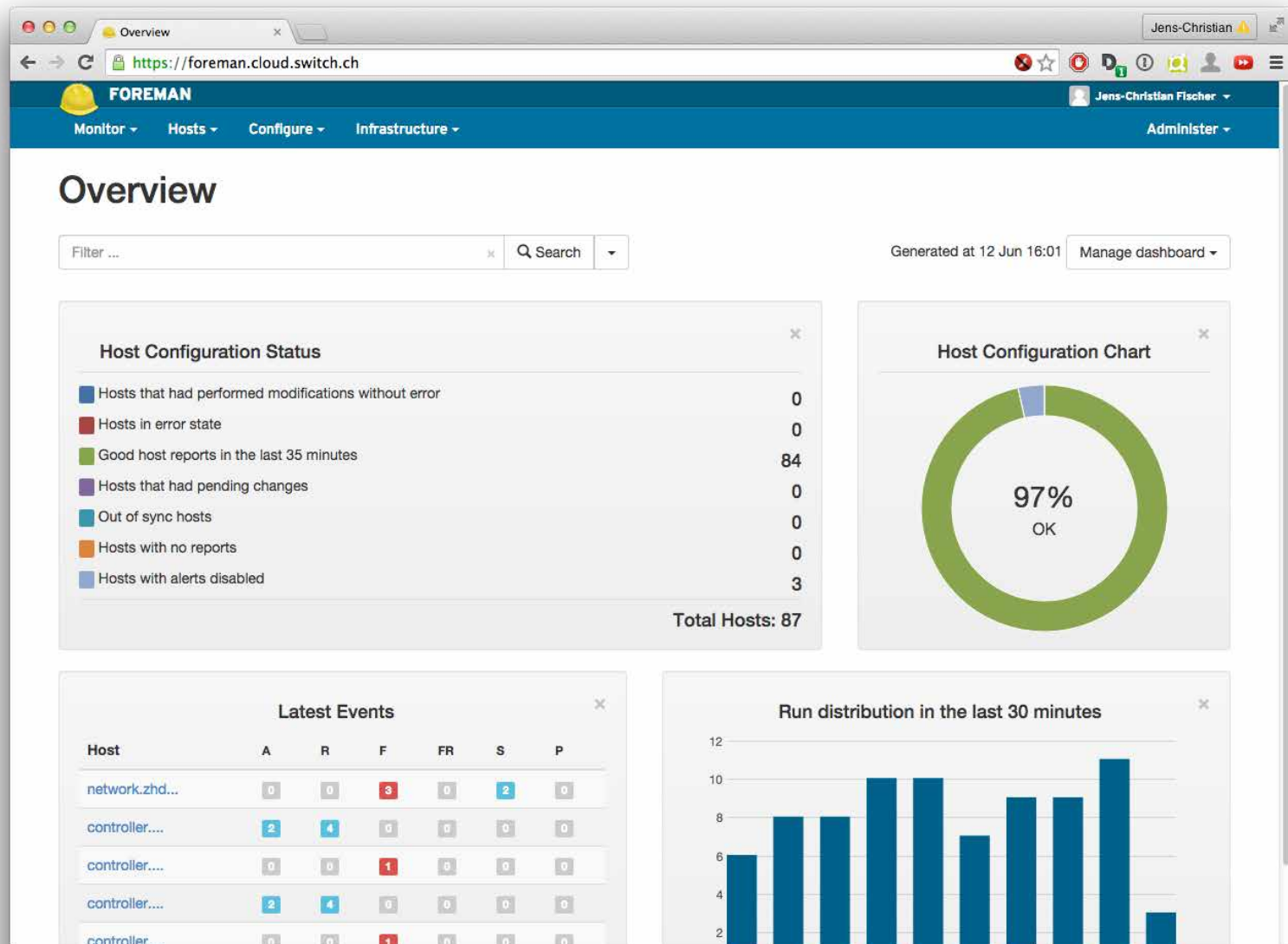


graphite™

Architecture



Infrastructure - Foreman

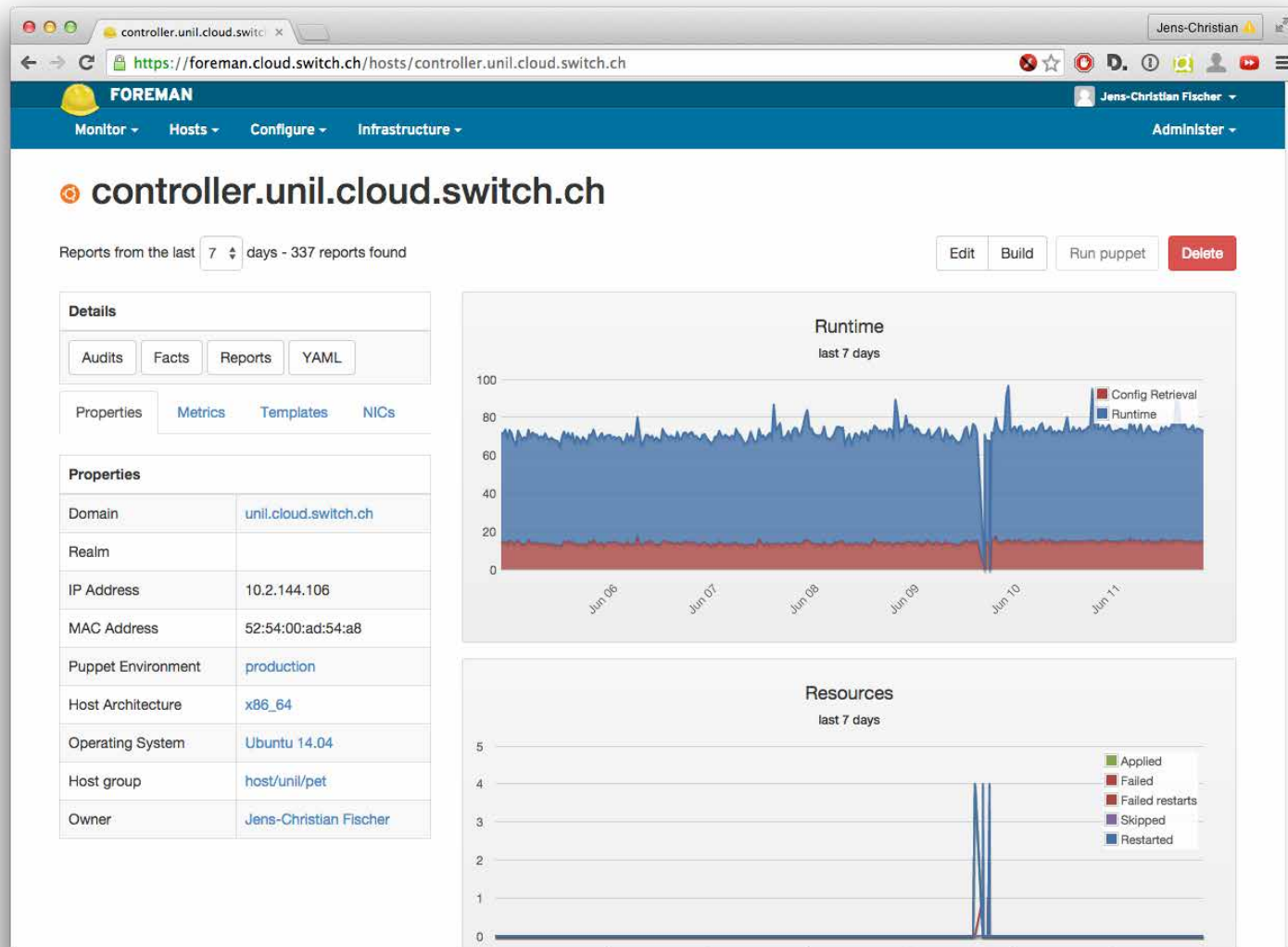


Ceph

- When 12 * 4 TB aren't enough, go distributed storage systems

```
$ ceph -s
  cluster yyyyyyyyyy-bdae-464b-a864-xxxxxxxxxxxx
  health HEALTH_OK
  monmap e2: 3 mons at
{zhdk0009=[2001:xxx::1009]:6789/0,zhdk0013=[2001:yyy::1013]:6
789/0,zhdk0025=[2001:yyy::1025]:6789/0}, election epoch 612,
quorum 0,1,2 zhdk0009,zhdk0013,zhdk0025
  osdmap e44762: 125 osds: 125 up, 125 in
  pgmap v20730639: 3336 pgs, 17 pools, 85088 GB data,
23864 kobjects
      279 TB used, 174 TB / 454 TB avail
      3317 active+clean
      19 active+clean+scrubbing+deep
  client io 10031 kB/s rd, 14072 kB/s wr, 1472 op/s
```

Foreman – Server Definition



Edit controller.unil.cloud.switch.ch

Unmanage host

Host

Puppet Classes

Interfaces

Operating System

Parameters

Additional Information

Included Classes

aadm
ceph
nagios::openstack_cinder
nagios::openstack_glance
nagios::openstack_heat
nagios::openstack_nova_head
scale::controller
switch::controller_mount_rbd
nagios
nagios::puppet_agent
switch

Available Classes

Filter classes

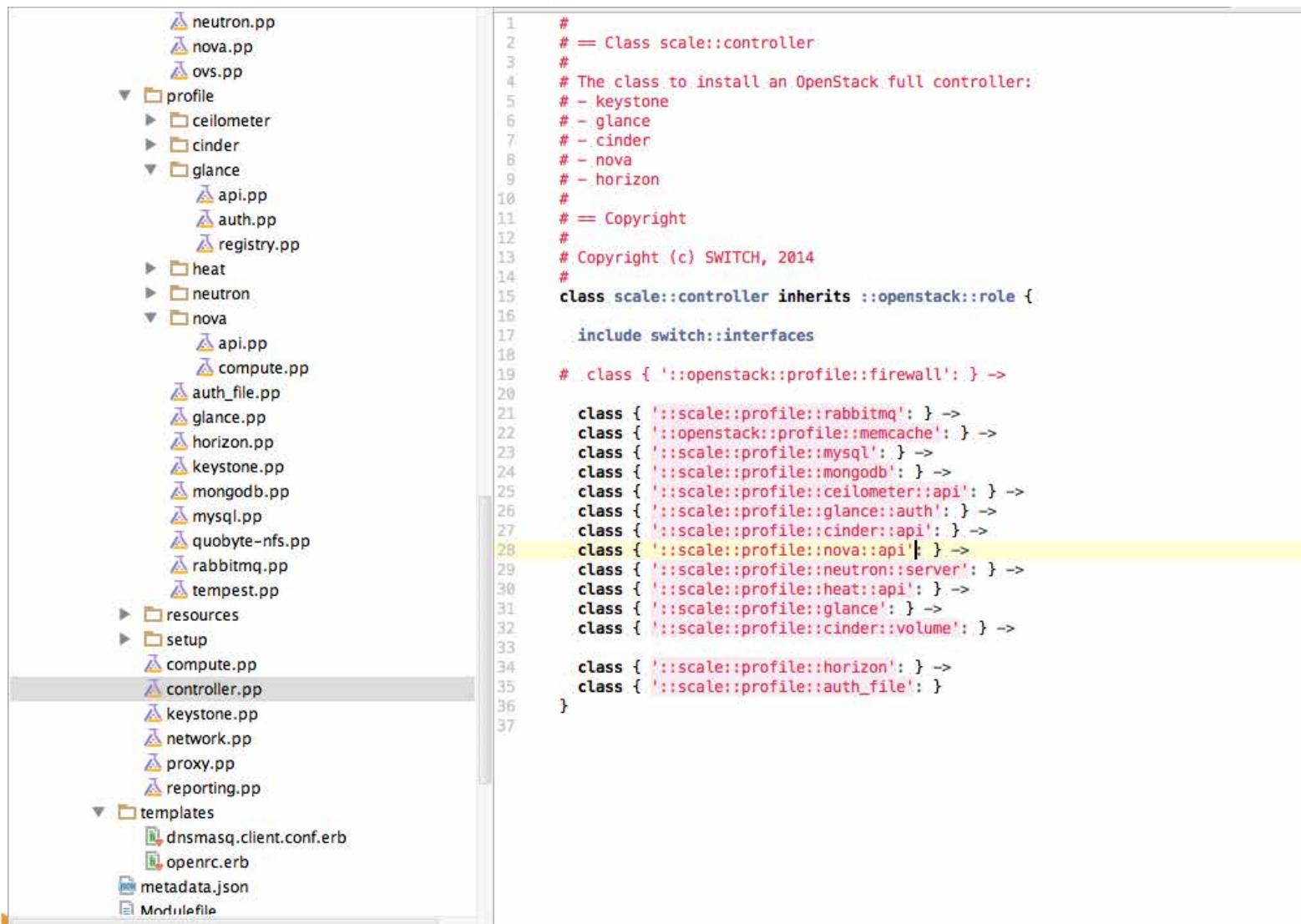
aadm
+ apache
+ apt
+ ceilometer
+ ceph
+ cinder
+ concat
+ epel
+ erlang
+ firewall
+ glance
+ heat
+ horizon
+ keystone
+ ldap
+ memcached
+ ntp
+ openstack
+ passenger
+ postgresql
+ proxy
+ qpid
+ quobyte
+ rabbitmq
+ radvd
+ rsync
+ ruby
+ rvm
+ scale
+ ssh
+ stdlib
+ swift

Puppet – Configuration Management

- <http://puppetlabs.com>
- <https://github.com/puppetlabs/puppetlabs-openstack>
- Modules for every component of OpenStack
- Generic Glue Modules that build the actual Cluster



Split between Code – Puppet



The image shows a Puppet module directory structure on the left and the corresponding code file on the right. The directory structure includes:

- neutron.pp
- nova.pp
- ovs.pp
- profile
 - ceilometer
 - cinder
 - glance
 - api.pp
 - auth.pp
 - registry.pp
 - heat
 - neutron
 - nova
 - api.pp
 - compute.pp
 - auth_file.pp
 - glance.pp
 - horizon.pp
 - keystone.pp
 - mongodb.pp
 - mysql.pp
 - quobyte-nfs.pp
 - rabbitmq.pp
 - tempest.pp
- resources
- setup
 - compute.pp
 - controller.pp
 - keystone.pp
 - network.pp
 - proxy.pp
 - reporting.pp
- templates
 - dnsmasq.client.conf.erb
 - openrc.erb
- metadata.json
- Modulefile

The code file on the right is a Puppet class definition for `scale::controller`. It includes comments and class definitions for various OpenStack services. The line numbers are visible on the left side of the code block.

```
1 #
2 # == Class scale::controller
3 #
4 # The class to install an OpenStack full controller:
5 # - keystone
6 # - glance
7 # - cinder
8 # - nova
9 # - horizon
10 #
11 # == Copyright
12 #
13 # Copyright (c) SWITCH, 2014
14 #
15 class scale::controller inherits ::openstack::role {
16
17   include switch::interfaces
18
19   # class { '::openstack::profile::firewall': } ->
20
21   class { '::scale::profile::rabbitmq': } ->
22   class { '::openstack::profile::memcache': } ->
23   class { '::scale::profile::mysql': } ->
24   class { '::scale::profile::mongodb': } ->
25   class { '::scale::profile::ceilometer::api': } ->
26   class { '::scale::profile::glance::auth': } ->
27   class { '::scale::profile::cinder::api': } ->
28   class { '::scale::profile::nova::api': } ->
29   class { '::scale::profile::neutron::server': } ->
30   class { '::scale::profile::heat::api': } ->
31   class { '::scale::profile::glance': } ->
32   class { '::scale::profile::cinder::volume': } ->
33
34   class { '::scale::profile::horizon': } ->
35   class { '::scale::profile::auth_file': }
36 }
37
```

Configuration - Hiera

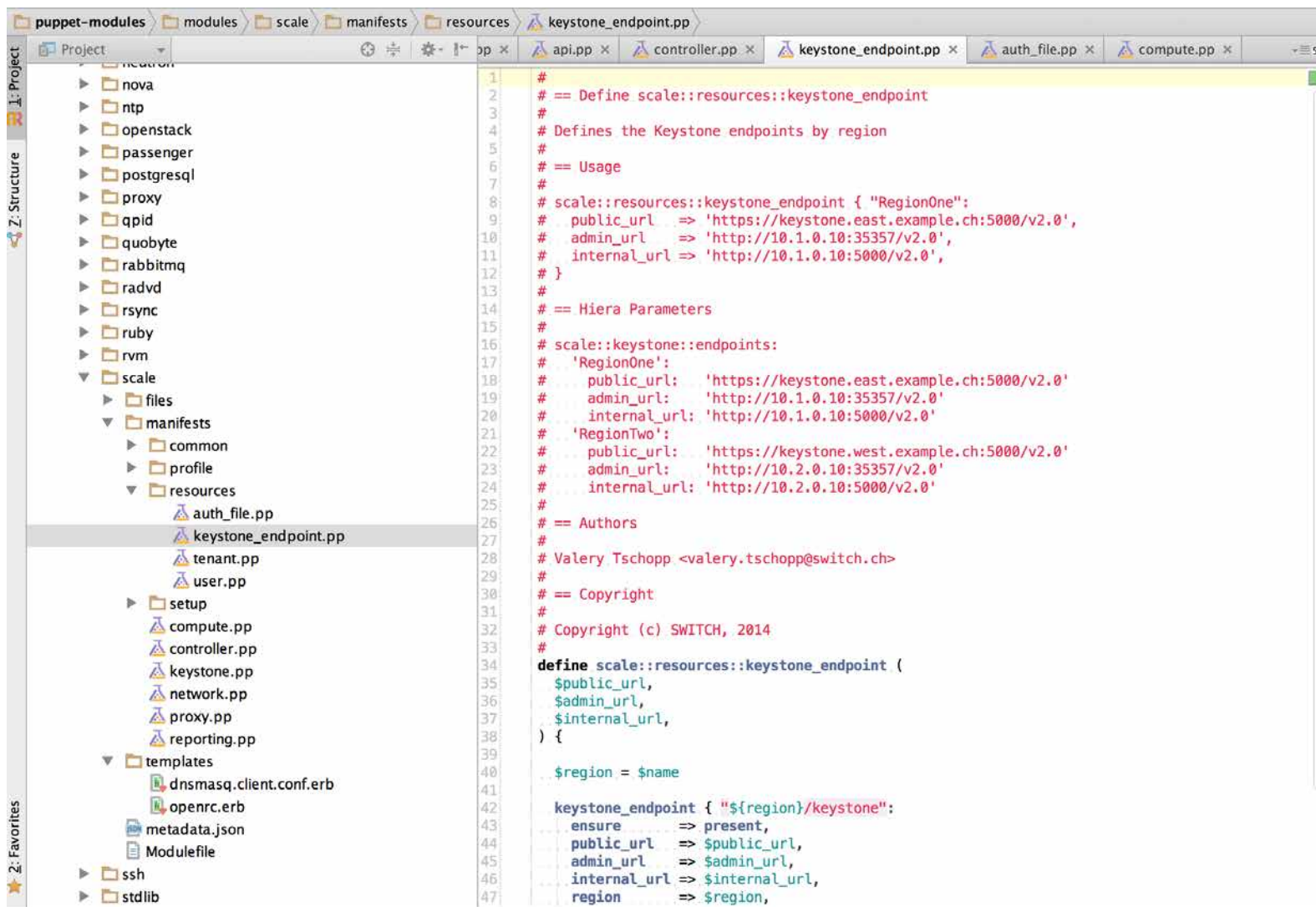
▼ puppet-config (~ /work/SWITCHcloud/puppet-config)

- ▼ hiera
 - ▼ domain
 - cloud.switch.ch.yaml
 - hot.tcloud.switch.ch.yaml
 - novalocal.yaml
 - s1.scloud.switch.ch.yaml
 - s2.scloud.switch.ch.yaml
 - unil.cloud.switch.ch.yaml
 - vgos.tcloud.switch.ch.yaml
 - vgvb.tcloud.switch.ch.yaml
 - zhdh.cloud.switch.ch.yaml
 - ▼ infrastructure
 - development.yaml
 - production.yaml
 - staging.yaml
 - test.yaml
 - testboot.yaml
 - ▼ node
 - .hiera
 - controller.yaml
 - controller-keystone.vgos.tcloud.switch.ch.yaml
 - controller-keystone.yaml
 - dhcp.s1.scloud.switch.ch.yaml
 - dhcp.s2.scloud.switch.ch.yaml
 - dhcp.unil.cloud.switch.ch.yaml
 - dhcp.vgos.tcloud.switch.ch.yaml
 - dhcp.vgvb.tcloud.switch.ch.yaml
 - dhcp.yaml
 - dhcp.zhdh.cloud.switch.ch.yaml
 - foreman.cloud.switch.ch.yaml
 - foreman.scloud.switch.ch.yaml
 - foreman-proxy.s2.scloud.switch.ch.yaml
 - foreman-proxy.zhdh.cloud.switch.ch.yaml
 - network.s1.scloud.switch.ch.yaml
 - network.s2.scloud.switch.ch.yaml
 - network.unil.cloud.switch.ch.yaml
 - network.yaml

```
1 # SWITCHcloud vagrant (with virtualbox provider) configuration
2
3
4 ##### Keystone
5 scale::keystone::service::protocol: 'http'
6 scale::keystone::service::host: "controller-keystone.%{::domain}"
7
8 ##### Openstack API proxying
9 ## req -> proxy -> controller APIs
10 scale::api::service::protocol: 'http'
11 scale::api::service::host: "controller.%{::domain}"
12
13 ##### interfaces
14 switch::interfaces::reboot_on_change: false
15
16 ##### networks
17
18 ipv6::site_number: 'fd'
19 ipv4::site_number: '253'
20
21 ##### IPv6 networks
22
23 ipv6::gateway::mgmt_rtd: "%{hiera('ipv6::mgmt_rtd')}:2"
24 ipv6::gateway::api: "%{hiera('ipv6::api')}:2"
25 ipv6::gateway::floating: "%{hiera('ipv6::floating')}:2"
26
27 ##### IPv4 networks
28
29 ipv4::mgmt_rtd: "192.168.28" # .32/27
30 ipv4::api: "192.168.28" # .0/27
31 ipv4::floating: "192.168.30" # /23
32 ipv4::floating_end: "192.168.31" # /23
33 # note: the host ip are formed by mere string concatenation -> no
34
35 ipv4::gateway::mgmt_rtd: "%{hiera('ipv4::mgmt_rtd')}.34"
36 ipv4::gateway::api: "%{hiera('ipv4::api')}.2"
37 ipv4::gateway::floating: "%{hiera('ipv4::floating')}.1"
38
39 ##### MTU
40 scale::mtu::dhcp_advertised: "1450"
41 scale::mtu::guest: "1450"
42 scale::mtu::management_network: "1500"
43
44 #####
45 switch::openvswitch::vlan_network: "%{hiera('ipv6::mgmt')}:1"
46 switch::openvswitch::vlan_network2: "%{hiera('ipv6::mgmt')}:2"
47
48 ## puppetlabs-openstack
```



Puppet Glue



```
1 #
2 # == Define scale::resources::keystone_endpoint
3 #
4 # Defines the Keystone endpoints by region
5 #
6 # == Usage
7 #
8 # scale::resources::keystone_endpoint { "RegionOne":
9 #   public_url => 'https://keystone.east.example.ch:5000/v2.0',
10 #   admin_url  => 'http://10.1.0.10:35357/v2.0',
11 #   internal_url => 'http://10.1.0.10:5000/v2.0',
12 # }
13 #
14 # == Hiera Parameters
15 #
16 # scale::keystone::endpoints:
17 #   'RegionOne':
18 #     public_url: 'https://keystone.east.example.ch:5000/v2.0'
19 #     admin_url:  'http://10.1.0.10:35357/v2.0'
20 #     internal_url: 'http://10.1.0.10:5000/v2.0'
21 #   'RegionTwo':
22 #     public_url: 'https://keystone.west.example.ch:5000/v2.0'
23 #     admin_url:  'http://10.2.0.10:35357/v2.0'
24 #     internal_url: 'http://10.2.0.10:5000/v2.0'
25 #
26 # == Authors
27 #
28 # Valery Tschopp <valery.tschopp@switch.ch>
29 #
30 # == Copyright
31 #
32 # Copyright (c) SWITCH, 2014
33 #
34 define scale::resources::keystone_endpoint (
35   $public_url,
36   $admin_url,
37   $internal_url,
38 ) {
39
40   $region = $name
41
42   keystone_endpoint { "${region}/keystone":
43     ensure => present,
44     public_url => $public_url,
45     admin_url  => $admin_url,
46     internal_url => $internal_url,
47     region      => $region,
```

Orchestrating the Orchestrator

- Ansible - <http://www.ansible.com/home>

```
ansible-playbook disable_puppet.yml -i cloud --sudo --ask-sudo-pass --extra-vars "hosts=production"
```

```
ansible-playbook prepare_release.yml -i cloud --sudo --ask-sudo-pass --extra-vars "modules=v1.3 config=v1.3.1"
```

```
ansible-playbook test_release.yml -i cloud --sudo --ask-sudo-pass --extra-vars "hosts=canary-vm-unil"
```

```
ansible-playbook do_release.yml -i cloud --sudo --ask-sudo-pass --extra-vars "hosts=zhdk-all"
```


Version? What version?

The screenshot shows the PetaSolutions switch.ch dashboard. At the top, there's a navigation bar with the PetaSolutions logo, a search bar, and user profile icons. Below the navigation bar, a blue banner indicates "Signed in successfully." The main content area displays a list of recent events, including push events, merge events, comments, and team updates. The sidebar on the left contains navigation links for "Your Projects", "Starred Projects", "Groups", "Milestones", "Issues", "Merge Requests", and "Help". The right sidebar shows a list of projects with a "Filter by name" input and a "New project" button.

Dashboard

Signed in successfully.

Push events Merge events Comments Team News Feed

Valéry Tschopp pushed to branch master at PetaSolutions.switch.ch / T... about an hour ago
925a4493 hide password in verbose

Valéry Tschopp commented on issue #2 at PetaSolutions.switch.ch / Tools about an hour ago
Aaaaaaah, controller.(unilzhdk) is already patched, that's why it is working now...

Valéry Tschopp pushed to branch master at PetaSolutions.switch.ch / T... about 2 hours ago
0e00b780 hide password in verbose

Valéry Tschopp commented on issue #2 at PetaSolutions.switch.ch / Tools about 2 hours ago
Strangely the user-projects script also use the keystone V3, but doesn't give the error?!

Simon Leinen commented on issue #2 at PetaSolutions.switch.ch / Tools about 2 hours ago
I added a comment to the launchpad page for bug #1240163. I'm still not sure what is the best way to fix this bug: Recognize more variants of the ...

Simon Leinen commented on merge request #336 at PetaSolutions.switc... about 3 hours ago
...

Simon Leinen pushed to branch Release-juno at PetaSolutions.switch.c... about 3 hours ago
646e08c5 Merge branch 'ab_disklookup_juno_sas' into 'Release-juno'
4b9848e9 Add sas2ircu disk blink utility
Compare → 785e2876...646e08c5

Simon Leinen accepted merge request #336 at PetaSolutions.switch.ch / ... about 3 hours ago
Add sas2ircu disk blink utility

Filter by name New project

- T PetaSolutions.switch.ch / Tools
- P PetaSolutions.switch.ch / pup...
- I PetaSolutions.switch.ch / imag...
- U PetaSolutions.switch.ch / usag...
- S PetaSolutions.switch.ch / scal...
- P PetaSolutions.switch.ch / pup...
- S PetaSolutions.switch.ch / swit...
- S PetaSolutions.switch.ch / swit...
- R PetaSolutions.switch.ch / rally
- V PetaSolutions.switch.ch / Virtu...
- A PetaSolutions.switch.ch / ansi...
- N PetaSolutions.switch.ch / nova...
- C PetaSolutions.switch.ch / Clou...
- S PetaSolutions.switch.ch / servi...
- S PetaSolutions.switch.ch / servi...
- I Jens-Christian Fischer / ignite...

Discussions

Discussion 3

Commits 1

Changes 1

11 participants

Valéry Tschopp @valery.tschopp · 12 days ago

Status changed to merged

Valéry Tschopp @valery.tschopp · 12 days ago

mentioned in commit [ce099324b520b79766310d64072c5beff030733f](#)

Simon Leinen started a discussion on the diff

```
modules/nagios/templates/check_logfiles_nova_head_conf.cfg.erb
7 7      warningpatterns => [
8 8          'WARNING', 'WRN', 'error', 'ERROR', 'ERR'
9 9      ],
10 -    warningexceptions => 'WARNING keystoneclient.middleware.auth_token [-] Authorization failed
    for token',
10 +    warningexceptions => [
```

1

Simon Leinen @leinen · 12 days ago

Link here

Edit

Remove

In case I reviewed the original change: I'm sorry that I didn't catch this. I noticed this in the overall diff between releases v1.16 and v1.17, and found it suspicious that the warningpatterns should be an array, and warningexceptions a simple string. But I didn't want to hold up the release for this.










@all Everybody (including myself), please try to be a little more careful in the future, thanks.

Reply

© 2015 SWITCH

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Merge Requests

-
-  **Simon Leinen** accepted merge request [#336](#) at [PetaSolutions.switch.ch / puppet-modules](#) about 3 hours ago
Add sas2ircu disk blink utility
-
-  **Simon Leinen** accepted merge request [#329](#) at [PetaSolutions.switch.ch / puppet-modules](#) 3 days ago
end to end nagios plugin, addition of total number of VMs as published KPI
-
-  **Valéry Tschopp** accepted merge request [#335](#) at [PetaSolutions.switch.ch / puppet-modules](#) 7 days ago
Fixed wrong parsing of filtered warning message
-
-  **Valéry Tschopp** accepted merge request [#334](#) at [PetaSolutions.switch.ch / puppet-modules](#) 7 days ago
Fixed wrong parsing of filtered message
-
-  **Simon Leinen** accepted merge request [#5](#) at [PetaSolutions.switch.ch / scale-test](#) 11 days ago
Make layout less irregular
-
-  **Simon Leinen** accepted merge request [#4](#) at [PetaSolutions.switch.ch / scale-test](#) 11 days ago
Node controller no longer needs RBD mount
-
-  **Valéry Tschopp** accepted merge request [#333](#) at [PetaSolutions.switch.ch / puppet-modules](#) 12 days ago
Fixed problem with filtering of WARNING keystoneclient.middleware.auth_token [-] Authorization failed for token for Juno
-
-  **Valéry Tschopp** accepted merge request [#332](#) at [PetaSolutions.switch.ch / puppet-modules](#) 12 days ago
Fixed problem with filtering of WARNING keystoneclient.middleware.auth_token [-] Authorization failed for token
-
-  **Valéry Tschopp** accepted merge request [#330](#) at [PetaSolutions.switch.ch / puppet-modules](#) 14 days ago
2 disable glance image cache
-

Monitoring

monitor@switch.ch

15. Juni 2015 13:34

To: Jens-Christian Fischer

[Hide Details](#)

Service: zhdk0024.[zhdk.cloud.switch.ch/L_check_logfiles](#): WARNING, Type: PROBLEM

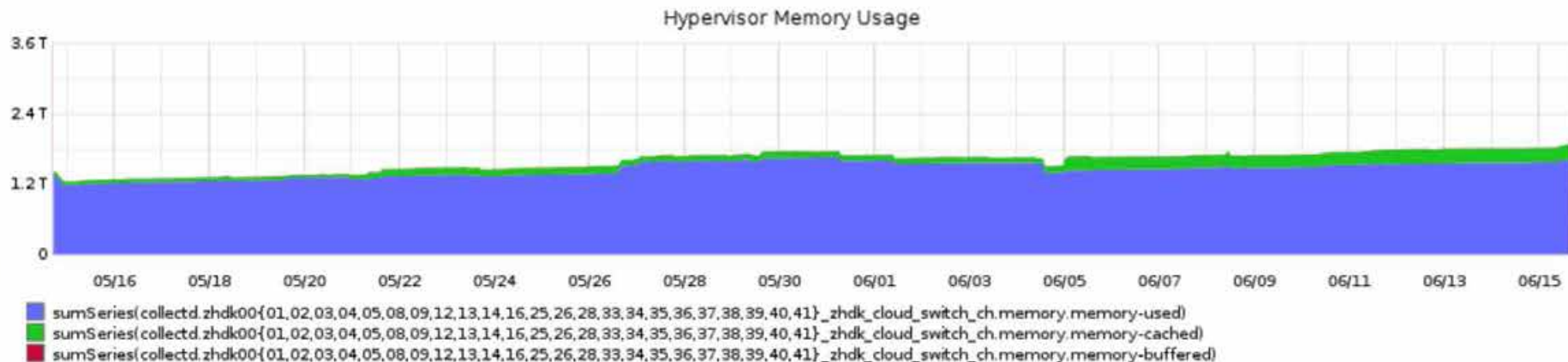
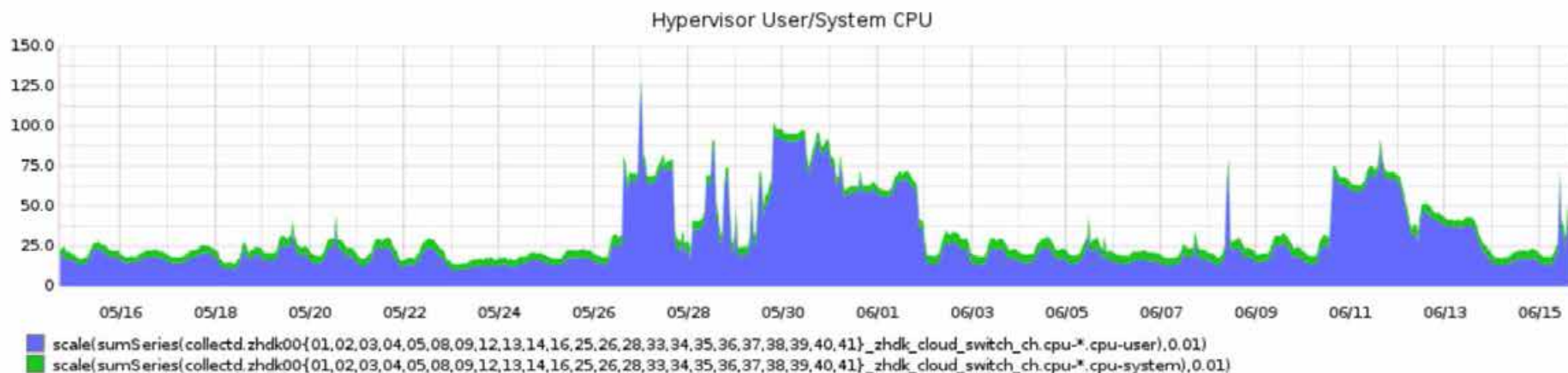
7

Host: zhdk0024.[zhdk.cloud.switch.ch](#)
Alias: zhdk0024.[zhdk.cloud.switch.ch](#)
Address: 2001:620:5ca1:100::1024
Service: L_check_logfiles
State: WARNING
Notificationtype: PROBLEM
Recipients:
Command: check_mk-mrpe
Output: WARN - WARNING - (2 warnings in check_logfiles.protocol-2015-06-15-13-34-26) - File=/var/log/ceph/ceph-osd.119.log
Message=2015-06-15 13:34:15.900352 7fd45b7fe700 0 -- [2001:620:5ca1:100::1024]:6835/185927 submit_message osd_op_reply(923361
rbd_data.bd32471a66d894.000000000000001e2 [stat,set-alloc-hint object_size 8388608 write_size 8388608,write 15360004096] v4476210069454
uv10069454 ondisk = 0) v6 remote, [2001:620:5ca1:100::1009]:0/1089960, failed lossy con, dropping message 0x5810d00 ...
Perfdata: osd_logs83_lines=0;;; osd_logs83_warnings=0;;; osd_logs83_criticals=0;;; osd_logs83_unknowns=0;;; osd_logs41_lines=1;;;
osd_logs41_warnings=0;;; osd_logs41_criticals=0;;; osd_logs41_unknowns=0;;; osd_logs19_lines=2;;; osd_logs19_warnings=0;;;
osd_logs19_criticals=0;;; osd_logs19_unknowns=0;;; osd_logs70_lines=1;;; osd_logs70_warnings=0;;; osd_logs70_criticals=0;;;
osd_logs70_unknowns=0;;; osd_logs75_lines=0;;; osd_logs75_warnings=0;;; osd_logs75_criticals=0;;; osd_logs75_unknowns=0;;;
osd_logs38_lines=1;;; osd_logs38_warnings=0;;; osd_logs38_criticals=0;;; osd_logs38_unknowns=0;;; osd_logs101_lines=0;;;
osd_logs101_warnings=0;;; osd_logs101_criticals=0;;; osd_logs101_unknowns=0;;; osd_logs119_lines=2;;; osd_logs119_warnings=2;;;
osd_logs119_criticals=0;;; osd_logs119_unknowns=0;;; syslog_lines=1;;; syslog_warnings=0;;; syslog_criticals=0;;; syslog_unknowns=0;;;
kern.log_lines=0;;; kern.log_warnings=0;;; kern.log_criticals=0;;; kern.log_unknowns=0;;; [sudo]

Usage

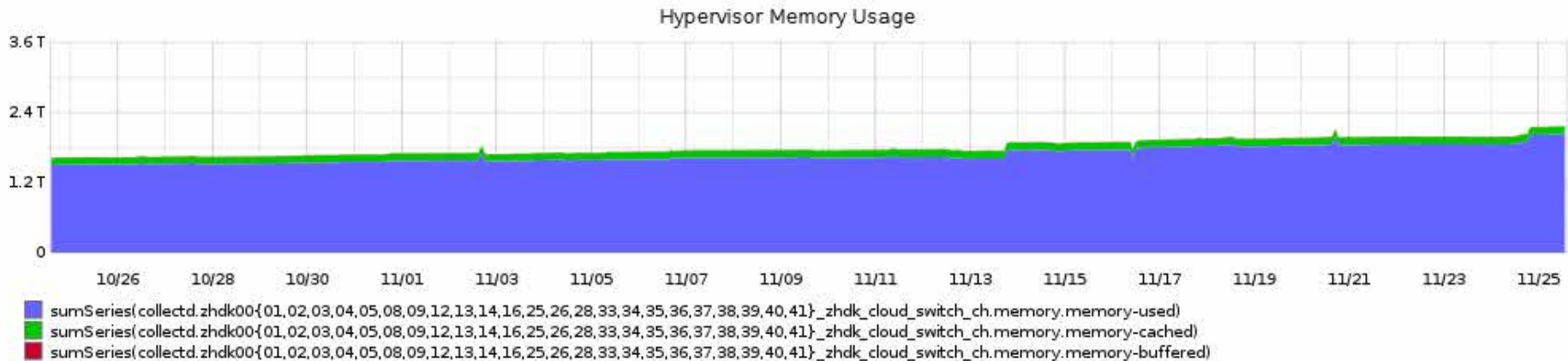
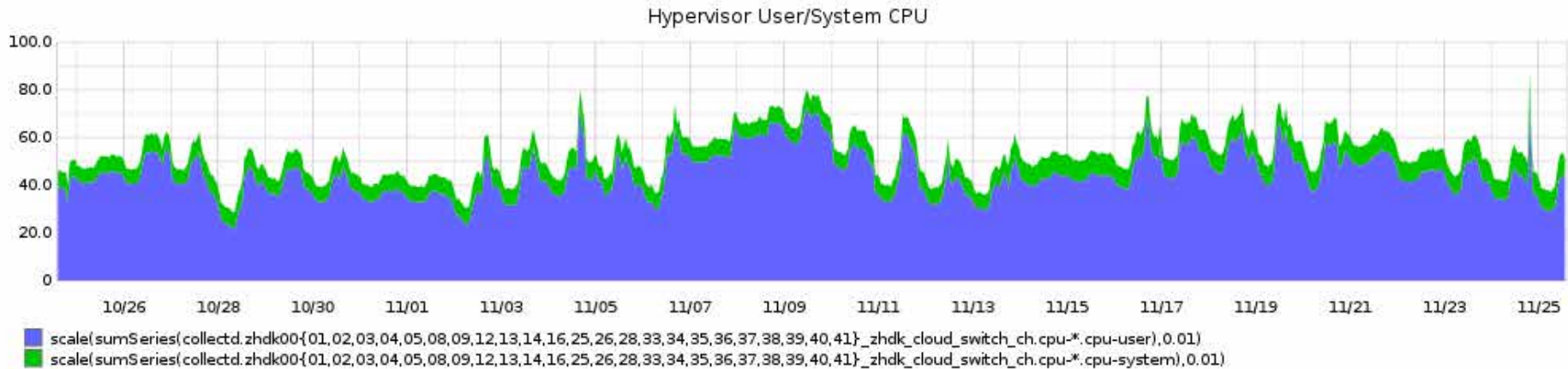
SWITCHengines Load

ZH Region



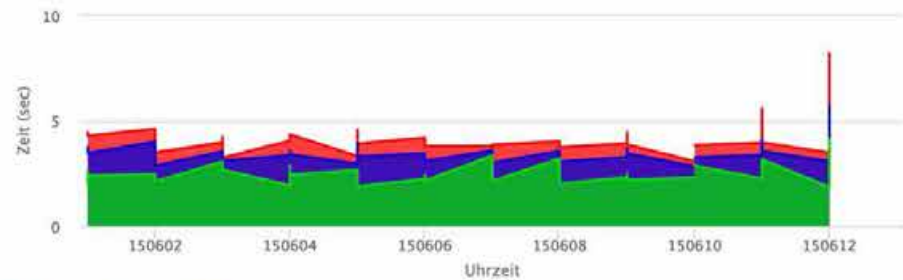
Usage (5 months later)

ZH Region

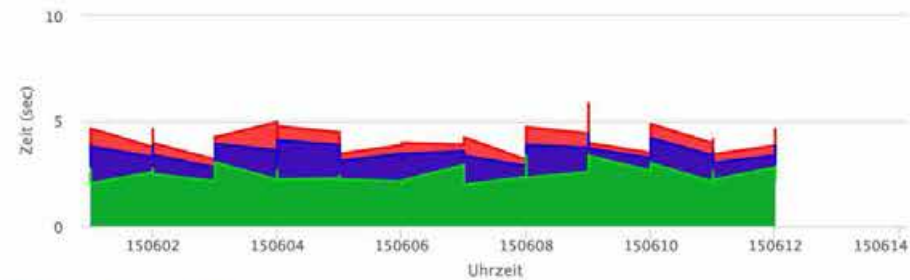


Performance

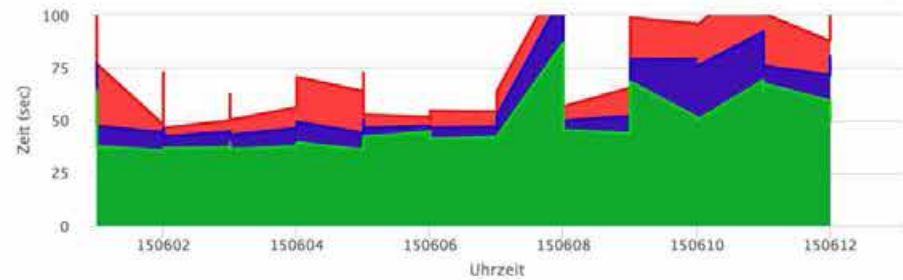
Neutron Performance im Cluster LS



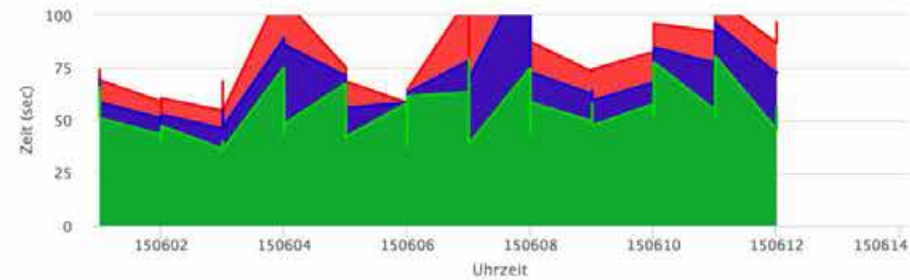
Neutron Performance im Cluster ZH



Nova Boot/Live Migration/Delete Perf. im Cluster LS



Nova Boot/Live Migration/Delete Perf. im Cluster ZH



Monitoring



Reporting

Mandant: switch.ch ▾

Fischer Jens Christian ▾

[Dashboard](#) > [Service](#) > [Virtuelle Maschinen](#) > smashbox (8bb2841b-7f87-4248-b53f-72ae6f3c5dc7)

Virtuelle Maschinen smashbox (8bb2841b-7f87-4248-b53f-72ae6f3c5dc7)

Allgemeine Informationen

Titel	smashbox
Server ID	8bb2841b-7f87-4248-b53f-72ae6f3c5dc7
Mandant	switch.ch
Image	---
Flavor	c1.medium
Region	LS
Projekt	SWITCHdrive7Staging
Benutzer	jens-christian.fischer@switch.ch
Open stack created at	Freitag, 08. Mai 2015, 11:36 Uhr
Open stack updated at	Donnerstag, 14. Mai 2015, 17:50 Uhr
Erstellt am	Freitag, 29. Mai 2015, 14:24 Uhr
Aktualisiert am	Freitag, 29. Mai 2015, 14:24 Uhr

Trackings

	CPU Hours	RAM Hours	DISC Hours
Aktuelle Woche	26	26 GB	260 GB
Letzte Woche	362	362 GB	3.54 TB
Letzter Monat	554	554 GB	5.41 TB
Total	554	554 GB	5.41 TB

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[✎ Virtuelle Maschine bearbeiten](#)

User Interface

Launch Instance

Details *

Access & Security *

Networking *

Post-Creation

Advanced Options

Availability Zone:

nova

Instance Name: *

Flavor: *

c1.micro

Instance Count: *

1

Instance Boot Source: *

--- Select source ---

Specify the details for launching an instance.

The chart below shows the resources used by this project in relation to the project's quotas.

Flavor Details

Name	c1.micro
VCPUs	1
Root Disk	20 GB
Ephemeral Disk	0 GB
Total Disk	20 GB
RAM	512 MB

Project Limits

Number of Instances

4 of 100 Used

Number of VCPUs

6 of 128 Used

Total RAM

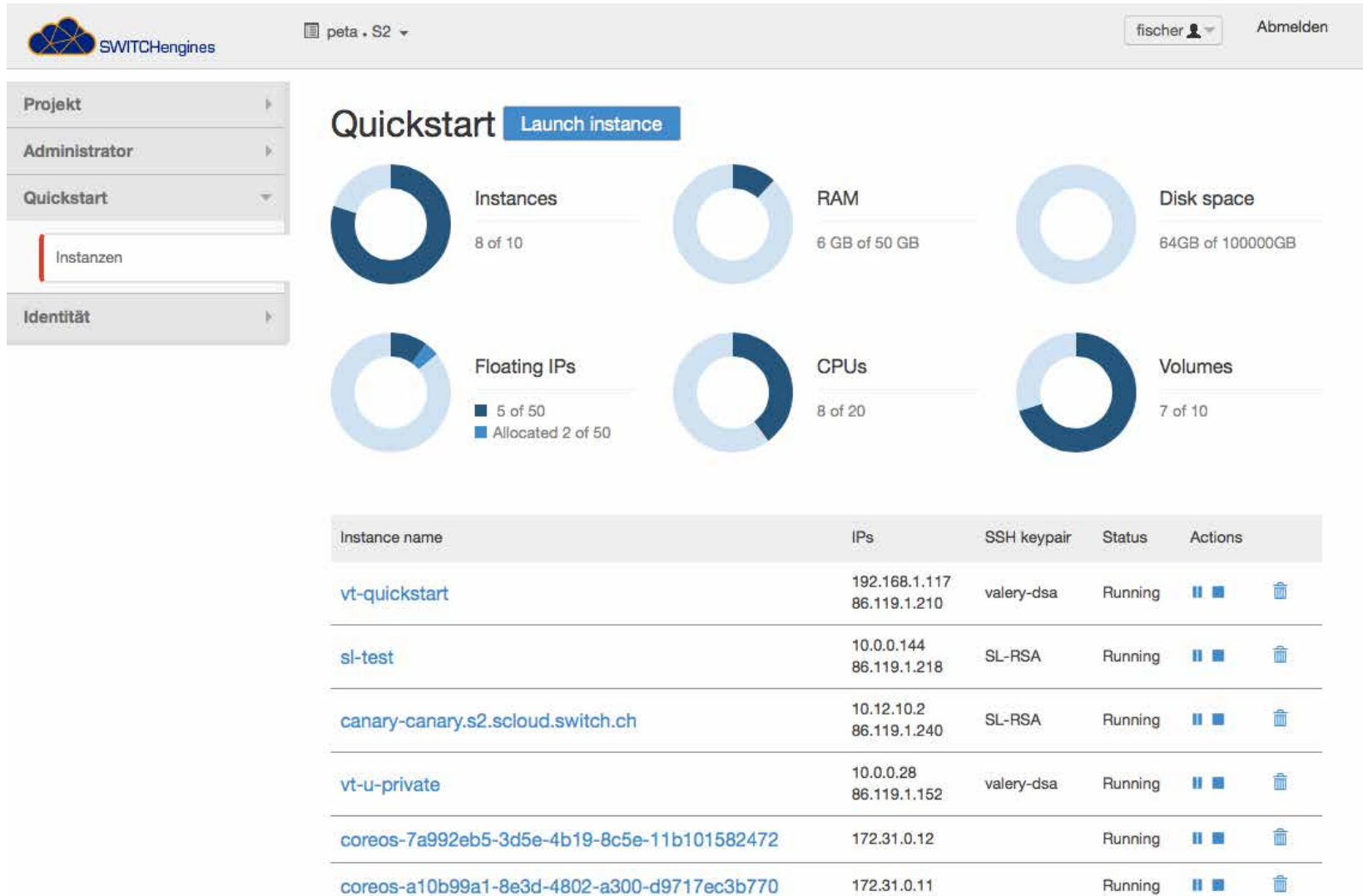
12,288 of 1,638,400 MB Used

Cancel

Launch



New UI





New UI


Create instance


CPU 18 of 20


RAM 16 GB of 50 GB

 Debian

 Test_saverio

 Ubuntu

 Fedora

 U14.04

Flavor

Due to your quota some flavors cannot be selected!

	Name	CPU	RAM	Disk
<input checked="" type="radio"/>	m1.tiny	1	512 MB	1 GB
<input type="radio"/>	m1.small	1	512 MB	20 GB
<input type="radio"/>	c1.micro	1	512 MB	20 GB
<input type="radio"/>	test.micro	1	512 MB	20 GB
<input type="radio"/>	c1.small	1	1 GB	20 GB
<input type="radio"/>	c1.medium	2	2 GB	20 GB

Launch instance

Cancel

OpenStack ++

- There is more to cloud than just cloud
- You need the tools
- You need the team
- And when you start to actually run the cloud, things get fun

When you build it, they will come

- Network simulations
- Digital Humanities
- Aerial Photography of Lake shores (Leman / Baikal)
- CoreOS / Docker Container orchestration
- Classroom VMs
- ATLAS computation nodes
- Lotus Domino Servers
- Web servers from University IT departments
- TOR exit nodes
- ...

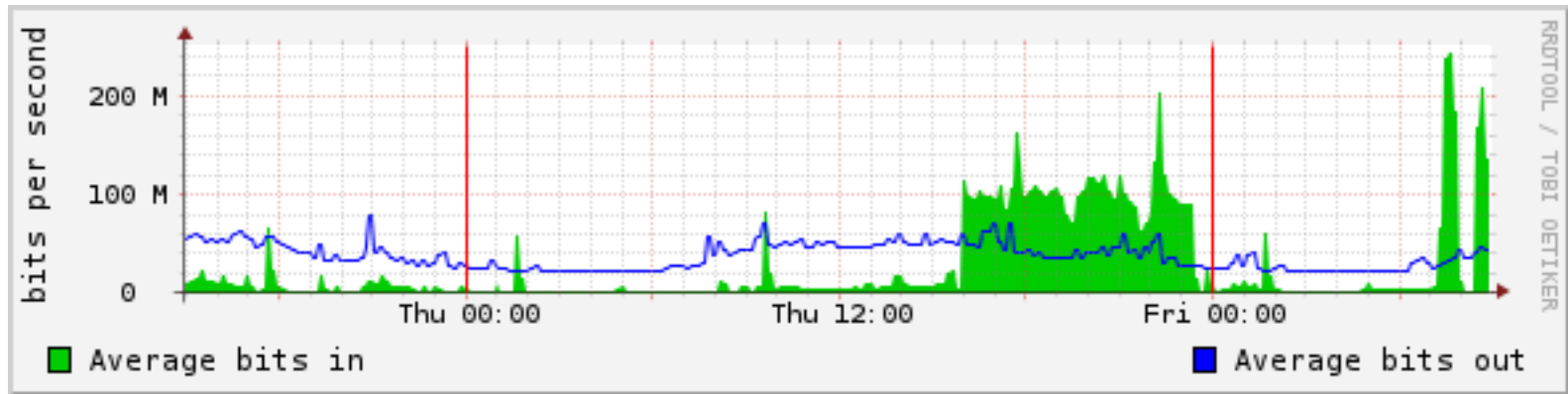
Joys of running a cloud

- User chooses “Public” network, her VM doesn’t launch
- Your network node takes down all VMs network connections
- A faulty disk causes major performance problems in a distributed, no SPOF storage system
- Your Performance test framework doesn’t delete default security rules => IPTables with 70’000 entries
- Your keystone service catalog entries get duplicated, all API access breaks because Keystone tokens are hashed differently
- ...

Joys of running a cloud

- Deleting a Cinder volume takes down your whole Storage API services (bug in the Cinder/Ceph integration)
- Users enable password login to their VM (because: Easier)
- Your organisation changes the way the Firewall rules are distributed to the routers
- You need to manage access for 650 users and 50 groups/tenants
- Your users exhaust the number of floating (public) IP addresses you have assigned to the Cloud network
- ...

Watch the network traffic



Part of a DDOS attack

- Users VM was hacked
- (see above: User enables password login)

