

SWITCHengines

Informationen für Informatikdienste



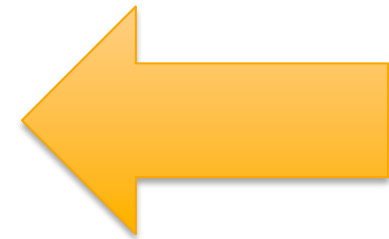
SWITCH

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Agenda

- What you get with SWITCHengines
- Status of the service
- Use Cases in the Community
- Service take up by users and organisations
 - Distribution Model
 - Tariff Model (Draft)
- Timeline and Roadmap (SCALE-UP)
- Q & A



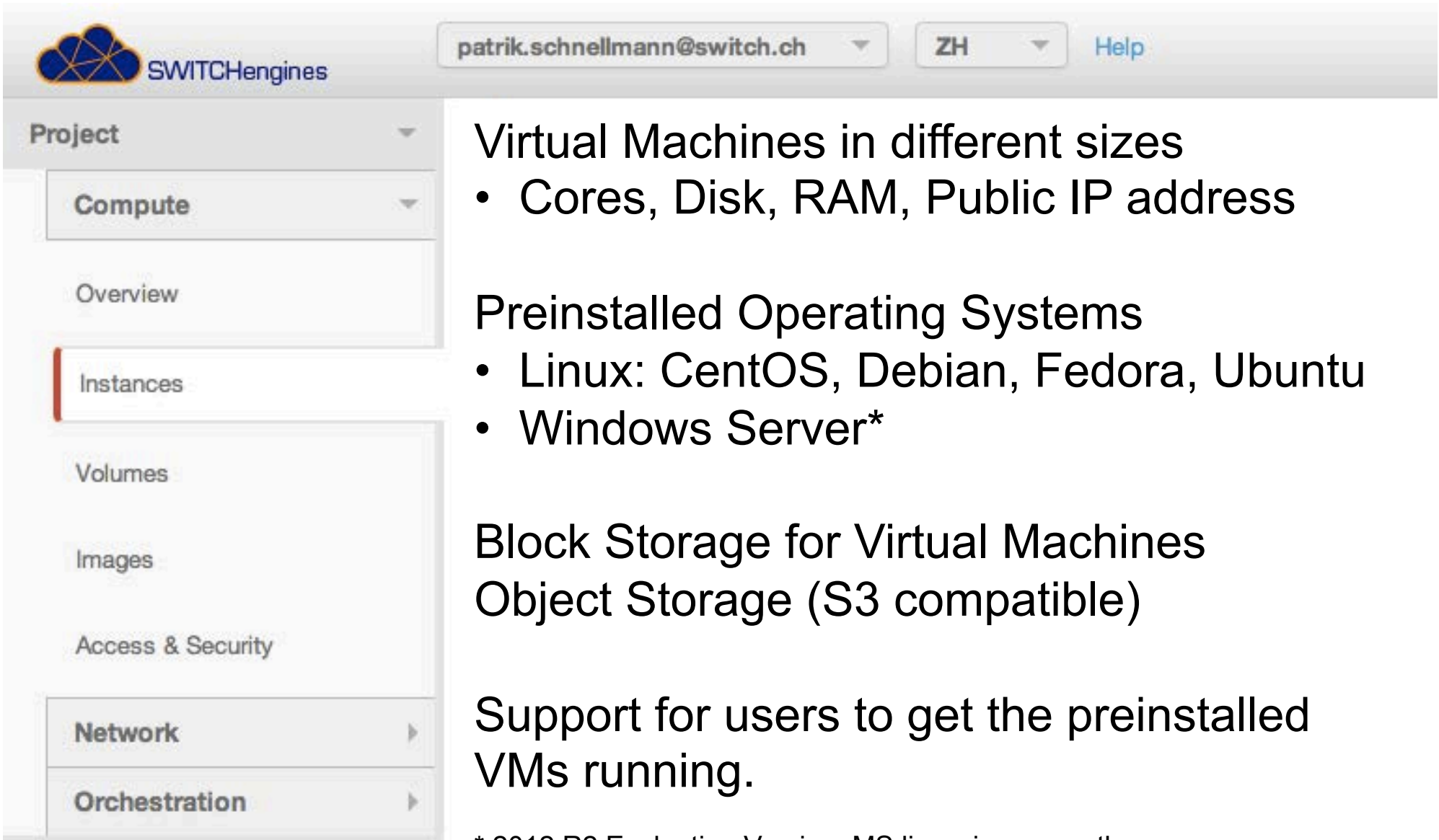
SWITCH Positioning

„We expand
the boundaries of your
infrastructure
under maximal
consideration
of your needs“

under your control

SWITCHlan,
IDM, security.
Data in CH,
support,
billing and
pooling benefits

What you get with SWITCHengines



The screenshot shows the SWITCHengines web interface. At the top left is the SWITCHengines logo. To its right is a user email dropdown menu showing 'patrik.schnellmann@switch.ch', a language dropdown menu showing 'ZH', and a 'Help' link. Below the header is a sidebar with a 'Project' dropdown menu. Under 'Project', there are several navigation options: 'Compute' (with a dropdown arrow), 'Overview', 'Instances' (highlighted with a red bar), 'Volumes', 'Images', 'Access & Security', 'Network' (with a right-pointing arrow), and 'Orchestration' (with a right-pointing arrow).

Virtual Machines in different sizes

- Cores, Disk, RAM, Public IP address

Preinstalled Operating Systems

- Linux: CentOS, Debian, Fedora, Ubuntu
- Windows Server*

Block Storage for Virtual Machines
Object Storage (S3 compatible)

Support for users to get the preinstalled VMs running.

* 2012 R2 Evaluation Version, MS licensing currently open

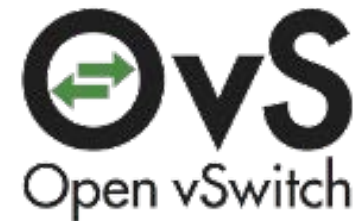
It's much more than OpenStack

Monitoring

Nagios[®]

graphite[™]

Virtualization



Automation,
Linux



ANSIBLE



Status of SWITCHengines

From pilot to the service

- Launched as a pilot service in October 2014
- Pilot phase until mid 2015
- Service with tariff effective from 2016

Community Usage

- More than 500 virtual machines
- More than 100 active users from the community

SWITCH Usage

- Used at SWITCH for SWITCHdrive, SWITCHfilesender, sourceforge mirror, ...

In development

- License Agreement with Microsoft
- Academic Software as a Service (“R” statistical software)

Results from recent user survey

- 79 respondents, mainly from universities of applied sciences, also universities, EPFL (and SWITCH)
- More long term usage (70%) of VMs than short term
- Requirement for “Compute” is stronger than for “Storage”
- **Without SWITCHengines, users would:**
 - Use existing or buy new hardware: 36 %
 - Use commercial offerings: 14 %
 - **Ask the IT service department: 30 %**

> 98 % of the users would use SWITCHengines if the services would be offered at their institution



SWITCHEngines

Typical Use Cases

Research

- Use SWITCHEngines instead of buying hardware (“under-the-desk hardware”)
- Analyse scientific datasets, e.g. texts, measurement data

Teaching

- Individual virtual machines for student projects
- Use personalized environment during semester, e.g. for computer science courses

SWITCH

- SWITCHdrive, SWITCHEngines, SWITCHfilesender

Available for projects within CUS P-2

- Storage and compute platform for national services, e.g. for Data Lifecycle Management, Open Access Data, ...

Service Take Up Overview

Information for heads of IT services mid of this year

- Ordering process and distribution model
- Tariff proposal
- Description of the service (scope, support, terms of use)
- Sample reporting (which information do IT services get from SWITCH)

Distribution model

Manager
(Billing Contact)
more than one possible per institution



- Head of IT services
- Head of department, institute

Administrators
(resource allocation, quota)



- IT service managers
- Local IT support

Virtual
Machines



Storage



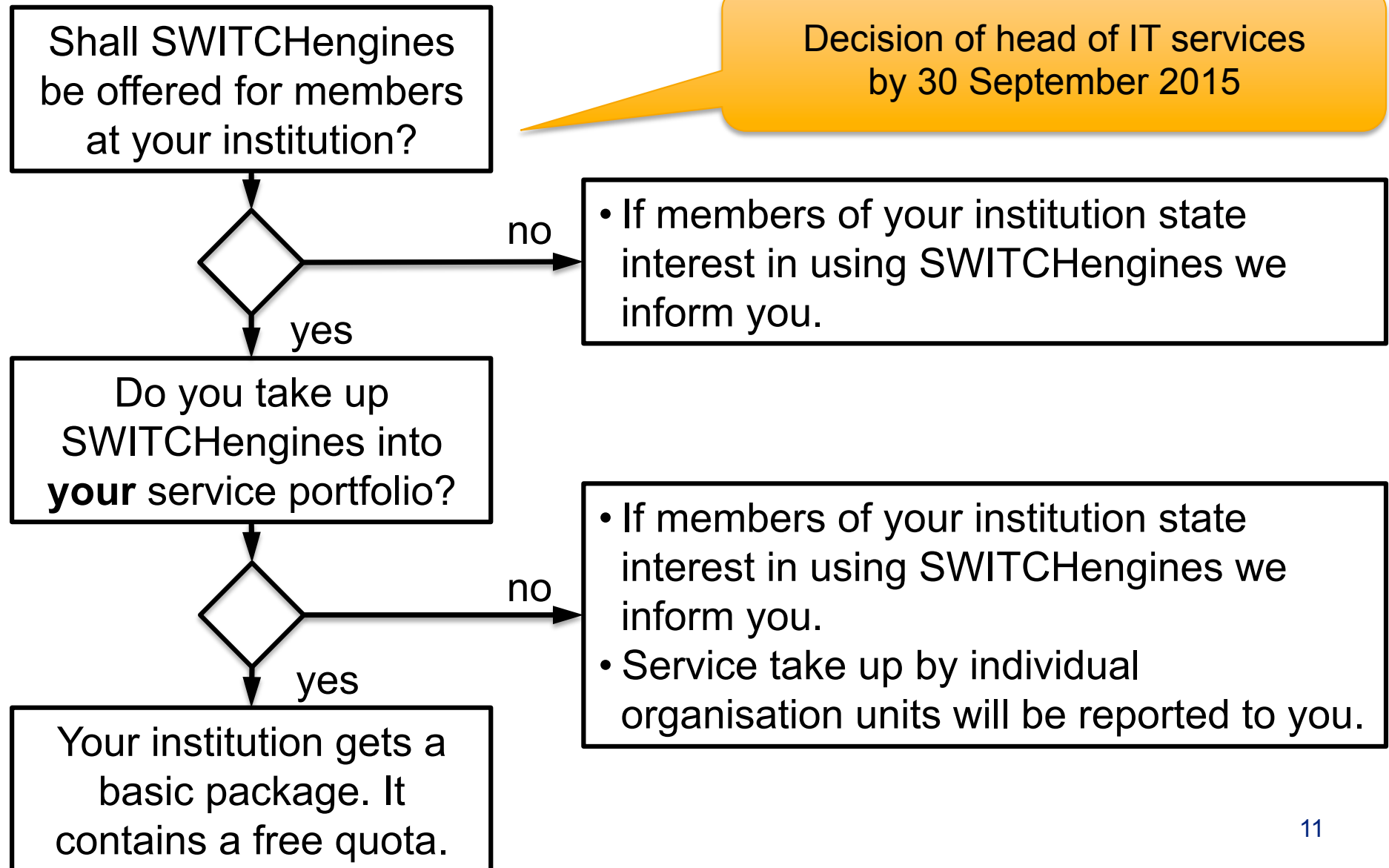
Software
(licenses ...)



User



Ordering process from the perspective of IT services (as of 2016)



Anzahl Server (Virtual Machines)

Bestimmen Sie die benötigte Anzahl Server.

What is the price?

Durchschnittliche Konfiguration pro Server.

Betriebssystem

Wählen Sie Ihr Betriebssystem.

Linux Kundentemplate

Virtual CPU (Core) pro Server

Durchschnittliche Anzahl Cores pro Server.

5

Virtual RAM (GB) pro Server

Durchschnittliche Grösse des Arbeitsspeichers pro Server.

36

Virtual Storage (GB) pro Server

Durchschnittlicher Storage (GB) pro Server (ohne Backup).

1000

Server Management

Wählen Sie Ihr Management Level.

Customer Managed (Kunde betreibt VM/Server selber)

Richtpreis

Anzahl Server (Virtual Machines)	250	
Betriebssystem	Linux Kundentemplate	CHF 0.00
Virtual CPU (Core)	1250	CHF 18'000.00
Virtual RAM (TB)	9	CHF 126'900.00
Virtual Storage (TB)	250	CHF 37'500.00
Server Management	Customer	CHF 0.00

Monatliche Gesamtkosten

ab CHF 182'400.00

Kosten pro Server (Virtual Machine)

ab CHF 729.60

Die Berechnungsgrundlage geht davon aus, dass sich mind. 5 VM/Server im virtuellen Data Center befinden.

Alle Preise in CHF exkl. MwSt. beim Bezug von 30 Tagen.
Effektive Verrechnung findet auf Tagesbasis statt, unabhängig von der Nutzungsdauer während des Tages.

- Ich möchte mehr zum Ergebnis aus dem Cloud Configurator erfahren, bitte kontaktieren Sie mich.
- Ich möchte meine individuelle Offerte gemäss meiner Konfiguration erhalten.

SENDEN

Tariff model (1 of 2)

Draft version

Elements in the tariff for SWITCHengines

- CPU Cores
- Disk storage
- RAM
- Public IP addresses
- Software licenses
- Reporting and billing is based on the time a user books the resources (running VMs, used storage)
- Reporting is done with a granularity per day

Tariff model (2 of 2)

Draft version

- Aggregation of the volumes at the billing contact
- Higher volumes, better conditions (cloud credit will be lower for high volumes)
- Initial package for IT services with free usage
- For our capacity planning we would ask for a non-binding prognosis

Cloud Credits

Draft version

Element	Cloud Credits (per year)
VM CPU per Core	36
VM RAM per GB	18
VM Disk storage per GB	0,5
Object storage per GB	0,14
Disk storage volume per 10 GB	1,1
Public IPv4 address	2

Costs per Cloud Credit (*current estimate*): 4 CHF

Examples with different usage profiles, 1

Draft version

Basic VM

Elements	Usage over 1 year	Cloud credits
CPU Cores	2	$2 * 36 = 72$
RAM	2 GByte	$2 * 18 = 36$
VM Disk storage	20 GByte	$20 * 0.5 = 10$
Public IP addresses	1	$1 * 2 = 2$
Total		120 Cloud Credits

Medium Usage

Elements	Usage over 1 year	Cloud credits
CPU Cores	4	$4 * 36 = 144$
RAM	8 GByte	$4 * 18 = 144$
VM Disk storage	20 GByte	$20 * 0.5 = 10$
Total		298 Cloud Credits

Examples with different usage profiles, 2

Draft version

CPU intense

Elements	Usage over 1 year	Cloud credits
CPU Cores	8	$8 * 36 = 288$
RAM	8 GByte	$8 * 18 = 144$
VM Disk storage	20 GByte	$20 * 0.5 = 10$
Total		442 Cloud Credits

CPU intense for a short period of time

Elements	Usage over 12 days	Cloud credits
30 virtual machines “CPU intense” (same as above) for 12 days		
CPU Cores	$30 * 8$	$30 * (8 * 1.184) = 283$
RAM	$30 * 8$ GByte	$30 * (8 * 0.592) = 142$
VM Disk storage	$30 * 20$ GByte	$30 * (20 * 0.016) = 10$
Total		435 Cloud Credits

Examples with different usage profiles, 3

Draft version

Storage intense

Elements	Usage over 1 year	Cloud credits
CPU Cores	2	$2 * 36 = 72$
RAM	2 GByte	$2 * 18 = 36$
VM Disk storage	20 GByte	$20 * 0.5 = 10$
Disk storage (volumes)	6 TByte	$600 * 1.1 = 660$
Public IP addresses	1	$1 * 2 = 2$
Total		780 Cloud Credits

Comparison with the market

Draft version

Different tariff models and offerings make it very difficult to compare prices
In general, providers bill depending on the intensity of usage (network traffic, disk activity – IOPS, etc.)

Predictability of the costs is hard because they depend on the usage!

Costs (CHF) per year

Provider	Small (2 Cores)	Medium (4 Cores)	Large (8 Cores)
Amazon	840	2'614	* 3'200
MS Azure	450	1'935	2'838
Google	423	* 1'300	2'252
Swisscom	720	2'808	2'772
CloudSigma	522	1'012	1'992
Exoscale	768	1'404	2'772
SWITCHengines	472	904	1'768

How do users get the service?

- Pilot phase, until end of September 2015:
 - Users contact SWITCH (see <http://www.switch.ch/engines>) or write an Email to engines-support@switch.ch
 - They will get an invitation URL to obtain SWITCHengines via Cloud Service Plattform
 - IT services are notified about new users within their institution (starting 1 July 2015)
- As of October 2015:
 - Availability of SWITCHengines depends on the decision of IT services
 - IT departments and other entities of institution (institutions, departments) enable the service for their users
- CUS P-2 project participants
 - directly contact SWITCH

Roadmap: SCALE-UP project

What is it?

- Collaborative project with the Swiss academic community in the CUS P-2 program
- 9 project partners with work packages, 15 letters of support

Goal

- Create academic services for research and education on cloud infrastructure

Status

- Proposal submitted in February 2015, to be approved

Duration

- August 2015 to end of 2016 (extension to 2017 pending)

Scalable Infrastructure for Cloud Services

Research in the Cloud

Classroom in the Cloud

Big Data Analytics

Statistics Tools

Scalable Database

Scientific Datapools

Container Technology

Collaborative Apps



SWITCHengines

- Virtual Private Cloud
- IPv6

Cloud Infrastructure

Questions and Answers

The background features a blue gradient with several dark blue server racks of varying heights. The racks are positioned on a layer of white, stylized clouds. Dotted white lines connect the racks, suggesting a network or data flow. The overall aesthetic is clean and modern, typical of a technical presentation.

You can always contact us!

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- patrik.schnellmann@switch.ch

<https://www.switch.ch/engines>