

VPC

Your VM in the Cloud

In your own network



SWITCH

Saverio Proto
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Open Cloud Day Bern

Infrastructure & Data Services



Your added value



- Simple administration; integrated into the academic network of SWITCH;
- security and identity services included
- Support for academic use cases
- Created together with you

Our customers



Higher education

- Cantonal universities
- ETH domain with research institutions
- Universities of applied sciences
 - Universities of teacher education

University-related organizations

- Spin-Offs
- Research institutions
- eLearning Center
- University hospitals

Our offer

- SWITCHengines
- Virtual Private Cloud (VPC)
- SCALE-UP (Project)*



* For developing academic services with 9 universities, as part of the „Scientific Information“ projects mandated by swissuniversities.

SWITCHengines



Customer tailored computing and storage performance for universities, research and teaching –further developed in the SCALE-UP project mandated by Swiss universities.

Customers

- Universities
- Research institutions
- eLearning Center
- University hospitals
- Spin-Offs

Services

- SWITCHengines (IaaS)
- Virtual Private Cloud (VPC)
- SCALE-UP (academic project)

Your benefits

- Your data in Switzerland
- Integrated network and security
- Support for academic use cases
- Simple administration and billing
- Created together with you



Virtual Private Cloud

Goal

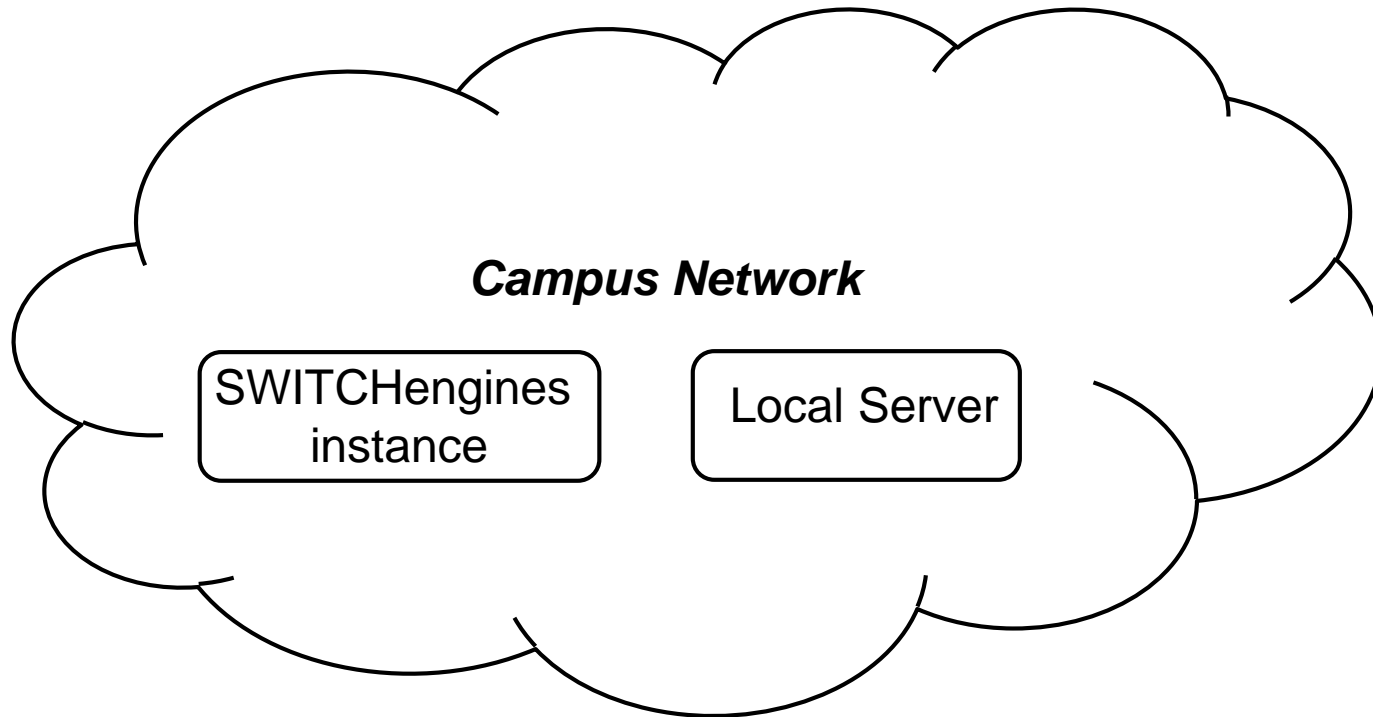
- Integration of Cloud VMs in campus network (**bring behind firewall**).

Benefits

- Access to internal services from VMs.
- Use Cloud VMs to enhance redundancy.
- Use Cloud VMs to scale out local the infrastructure.



Virtual Private Cloud



SCALE-UP WP10: Virtual Private Cloud



Terms

- SWITCHengines: SWITCH IaaS (Infrastructure as a Service), running on OpenStack
- SCALE-UP WP10 is about Virtual Private Cloud (VPC).

Persons Involved

- Fachhochschule St. Gallen (FHSG): Tom Schönenberger (work package leader), Stephan Gerber
- SWITCH: Patrik Schnellmann, Saverio Proto, Alexander Gall, Harald Staub



Example Use Cases

Example Use Cases of FHSG

- Domino Server, e.g. Web Server
- Windows Domain Controller, e.g. DNS Server
- NFS storage



Solution implementation

We implement a tunnel between the campus network and our cloud datacenter.

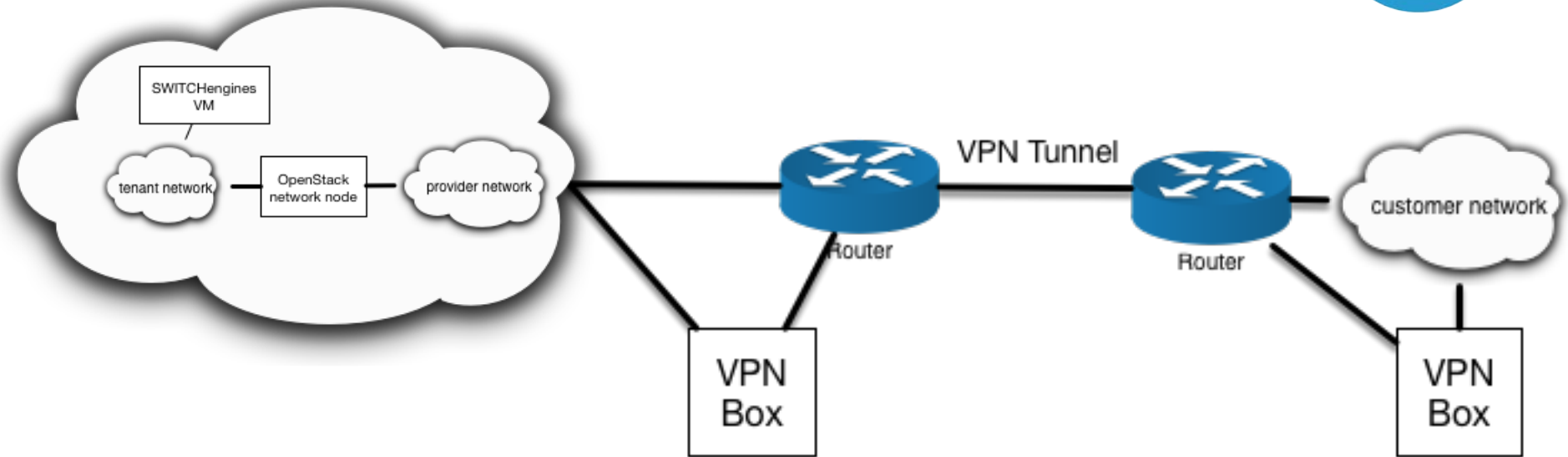
- Over IPv6
- Using a SWITCH hardware appliance, the ALX box.

At the Cloud Datacenter we enabled Openstack to bridge a Tenant Network to a physical layer 2 network.



Tunnel Part: Cross Backbone

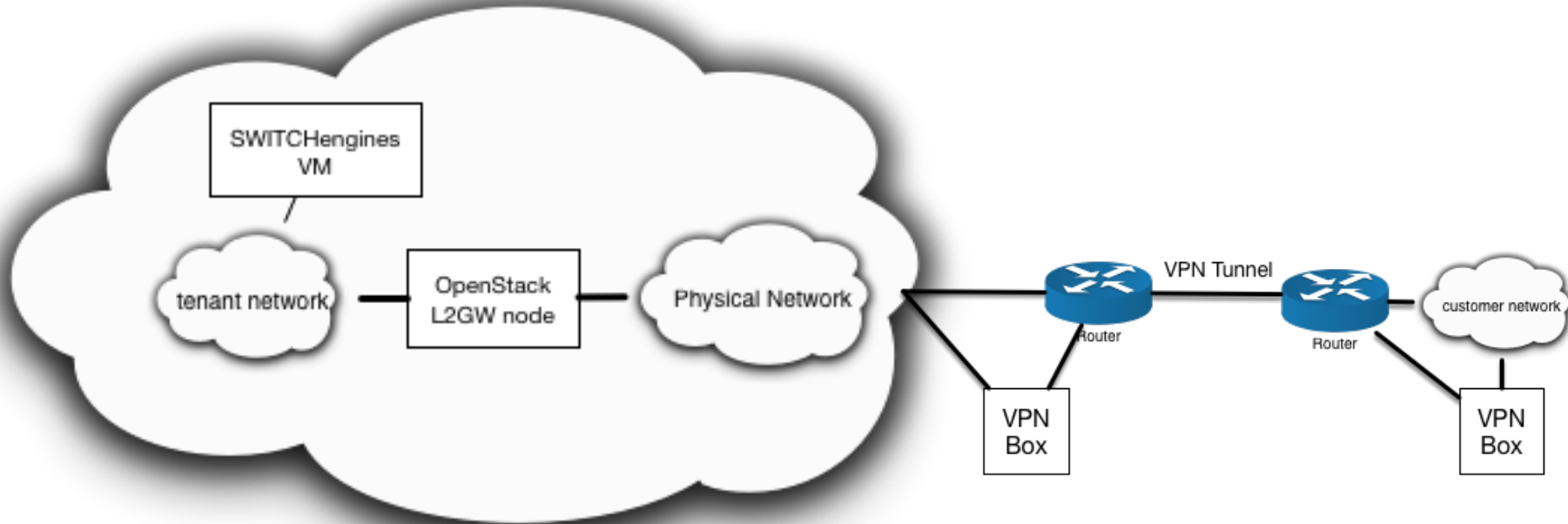
SWITCH cloud network



- Layer 2 Connection
- ALX box managed remotely by SWITCH Global LAN as an appliance.
- ALX Box (Agile LAN eXtender)

Tunnel Part: OpenStack

SWITCH cloud network



OpenStack “l2gw” Neutron Plugin

- Layer 2 Connection

Openstack operators

```
l2-gateway-create --device \  
name="myphyswitch",interface_names="ethX" \  
customername
```

```
l2-gateway-connection-create \  
    <GATEWAY-NAME/UUID> <NETWORK-NAME/UUID>
```



ALX Box Hardware



- Advantech networking appliance
- Several 1GE interfaces.
- Typically one 1 GE interface for IPMI and Access.
- Dual 10 GE.
- Single CPU Socket: Intel Xeon 4 Core
- Redundant Power Supply



ALX Box Requirements

Requirements:

- IPv6
- MTU >> 1'500 on router

→

- Both requirements already fulfilled by SWITCH router (no restrictions for the university network).
- Box can be placed deeper inside the university site (more flexible than MPLS)



ALX Software

- NixOS: Linux distribution with good handling of Releases (precise definition, easy upgrades and rollbacks)
- Snabb: toolkit for fast networking in user space (Lua)
- l2vpn: Layer-2-VPN (Snabb application)
- ALX (Agile LAN eXtender)

→

- written by Alexander Gall, SWITCH



Alternatives to VPC

- OpenStack VPNaaS
- Dedicated VPN VM
- VM including VPN Client



Next Steps

- Pilot phase with FH St. Gallen
- Further deployments in 2017 as limited Beta
- Interested ? please contact:
- Saverio Proto saverio.proto@switch.ch

30 Years

SWITCH – an integral part of the Swiss academic community since 1987.

www.switch.ch/30years

