Using RESTful APIs in z/VM Cloud Connector for z/VM automation

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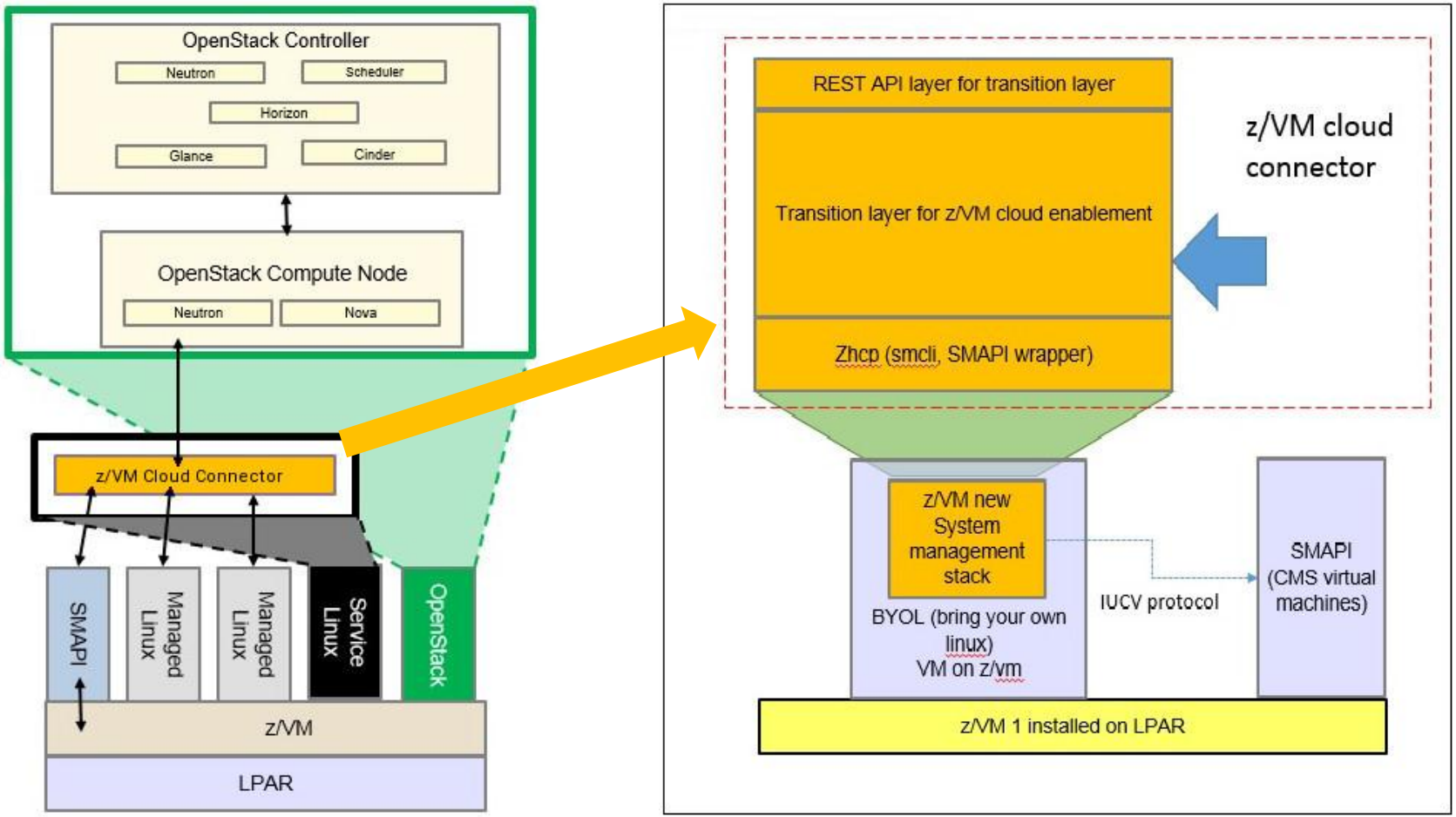
Agenda

- About the z/VM Cloud Connector
- Deploying the z/VM Cloud Connector
- Demonstration of RESTful API calls
- OpenStack interacting with the z/VM Cloud Connector

About the z/VM Cloud Connector

- z/VM Cloud Connector is open source
  - https://github.com/openmainframeproject/python-zvm-sdk
  - https://cloudlib4zvm.readthedocs.io/en/latest/ (documentation)
- Being moved under the governance of the Open Mainframe Project
- RESTful APIs that interact with z/VM 6.4 or 7.1
- Can manage guests, images, network, volume, etc.
- Develop your own automation
- Use technologies to interact with z/VM Cloud Connector
  - OpenStack
  - VMware vRealize Automation
  - Terraform


OpenStack Controller
Neutron
Scheduler
Horizon
Glance
Cinder
OpenStack Compute Node
Neutron
Nova
z/VM Cloud Connector
SMAPI
Managed Linux
Managed Linux
Service Linux
OpenStack
z/VM
LPAR
REST API layer for transition layer
Transition layer for z/VM cloud enablement
Zhcp (smcli, SMAPI wrapper)
z/VM cloud connector
z/VM new System management stack
BYOL (bring your own linux) VM on z/vm
IUCV protocol
SMAPI (CMS virtual machines)
z/VM 1 installed on LPAR

Technical details

- **Two components comprise z/VM Cloud Connector**
  - zthin package which is built during installation
  - python-zvm-sdk implements APIs that interact with zthin
- **Apache with wsgi plugin provide http access to RESTful APIs**
- **Supports flat and vlan vswitch for guest networking**
- **Supports ECKD or FBA disk pools for image and disk operations**
- **Connect guests to FCP based storage**
- **Includes tools for creating and deploying operating system images**
- **Username/password or token based security model**
- **Works with and without security/access control (RACF tested)**

Guest operations

- Start
- Stop
- Graceful shutdown
- Pause
- Unpause
- Reboot operating system
- Graceful z/VM guest logoff and restart
- Live migration in SSI cluster
- Register existing guests to be managed by z/VM Cloud Connector
- Resize guest CPUs (live and logoff required)
- Resize guest memory (live and logoff required)
- Add/remove NICs
- Capture/deploy images

* Review documentation for RESTful API details

Deploying the z/VM Cloud Connector

with SUSE Linux Enterprise Server 15

z/VM Cloud Connector deployment notes

Follow the sections and notes outlined below while reading the project documentation.

- install, register and patch sles15 on z
- configure and test z/vm cloud connector on sles15
  - NOTE: perform the steps for each section of the z/VM Cloud Connector documentation listed below
  - 3.1.1
    - add CLDCONN (z/vm guest name) to vsmwork1.authlist
      - NOTE: use " in xedit to copy a line in vsmwork1.authlist
    - add option lnknopas for cldconn
    - iucv any was already in directory entry
    - 4 and 5
      - NOTE: had to add commands to /etc/init.d/after.local so these are enabled after reboot
  - 3.2.1 and 3.2.2
    - zypper ar -fc https://download.opensuse.org/repositories/home:/mfriesenegger:/zVMCloudConnector/SLE_15/ zvmcloudconn
    - add packagehub repo using SUSEConnect
    - zypper in python2-zvm-sdk zthin

z/VM Cloud Connector deployment notes

- configure and test z/vm cloud connector on sles15 (continued)
  - 3.2.3
    - su – zvmsdk
    - ssh-keygen
      - NOTE: take all of the defaults
      - NOTE: will use the ssh key once openstack is installed
  - 3.3
    - edited the following in /etc/zvmsdk/zvmsdk.conf
      - my_ip=
      - disk_pool=
      - user_profile=osdflt
        - NOTE: verify that osdflt directory profile exists
  - 3.4
    - verify user and all directories exist
      - NOTE: all of the directories existed but needed chown done
    - sudo package needed to be installed as prerequisite

z/VM Cloud Connector deployment notes

- configure and test z/vm cloud connector on sles15 (continued)
  - 3.5 and 3.6
  - 4.5
    - zypper in apache2 apache2-mod_wsgi
    - vi /etc/apache2/vhosts.d/zvmsdk_wsgi.conf

```
Listen 8080
<VirtualHost *:8080>
    WSGIDaemonProcess zvmsdkwsgi user=zvmsdk group=zvmsdk processes=2 threads=5
        WSGIProcessGroup zvmsdkwsgi

    WSGIScriptAlias / /usr/bin/zvmsdk-wsgi
    TimeOut 3600
    <Directory /usr/lib/python2.7/site-packages/zvmsdk/sdkwsgi>
        Require all granted
    </Directory>

    <Directory /usr/bin>
    <Files zvmsdk-wsgi>
        Require all granted
    </Files>
    </Directory>
</VirtualHost>
```

z/VM Cloud Connector deployment notes

- configure and test z/vm cloud connector on sles15 (continued)
  - 4.5 (continued)
    - systemctl enable apache2
    - systemctl start apache2
  - 4.3
    - simple curl test to prove it works
    - additional curl tests
      - vi ~/create-guest-gst00001.json

```
{
  "guest":
  {
     "userid": "gst00001",
     "vcpus": 1,
     "memory": 1024,
     "user_profile": "osdflt",
     "disk_list":[
     {
        "size": "1g",
        "is_boot_disk": "True",
        "disk_pool": "ECKD:pool"
     }],
     "max_cpu": 4,
     "max_mem": "2G"
  }
}
```

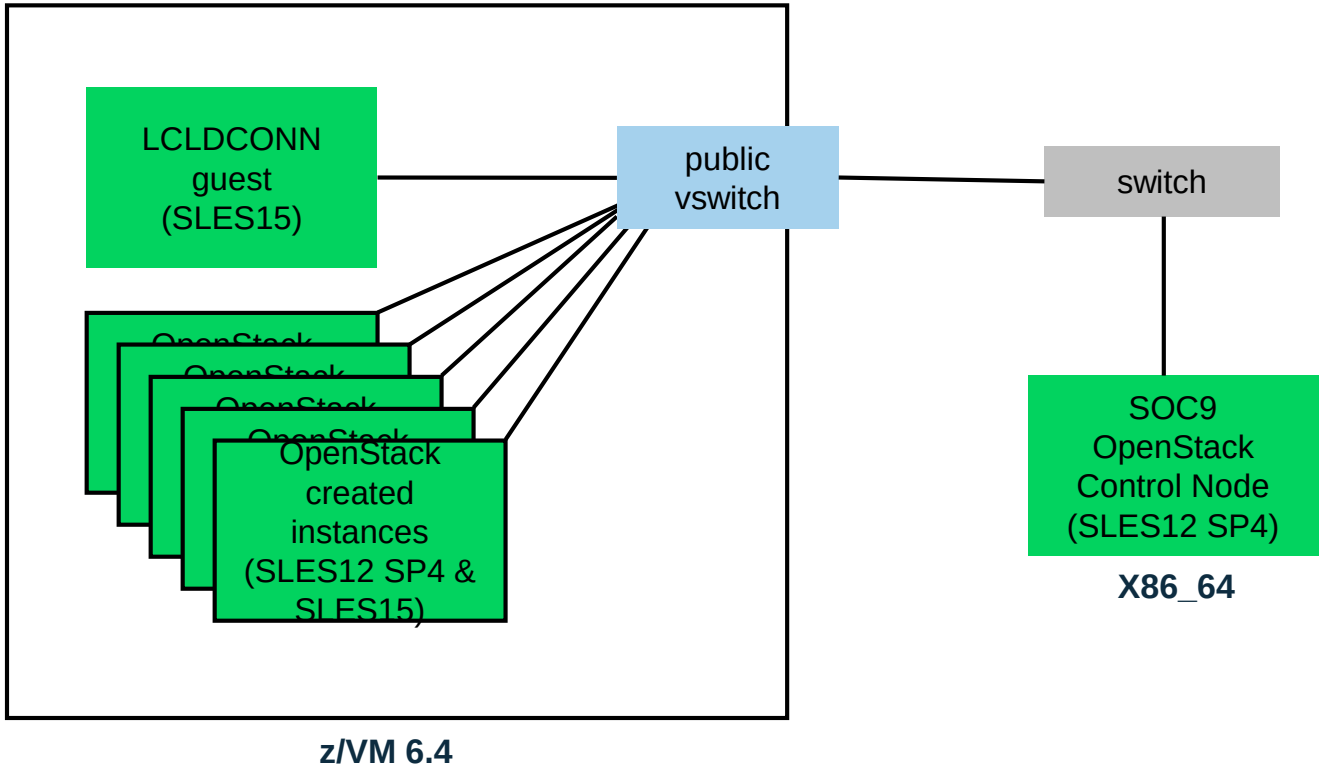
      - curl -X POST -H "Content-Type: application/json" -d @create-guest-gst00001.json http://localhost/guests
      - curl http://localhost/guests
      - curl http://localhost/guests/GST00001
      - curl -X DELETE http://localhost/guests/GST00001

OpenStack interacting with z/VM Cloud Connector

Using OpenStack with the z/VM Cloud Connector

- **OpenStack Compute service (nova) driver for z/VM was merged into OpenStack Rocky**
  - No extra step required to install a z/VM nova driver
- **Openstack Networking service (neutron) and Telemetry Data Collection service (ceilometer) are installed as plugins**
  - Packages are available on the Open Build Service

Lab diagram using SUSE OpenStack Cloud 9

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