Automating VMware-based VM migrating to KVM using V2V and Ansible

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Agenda

● Background and Why
  ○ Digital transformation: migrate to cloud infrastructure based on open standard
  ○ How virt-v2v fit in

● What’s the virt-v2v
  ○ Basic features
  ○ One short video demo showing how virt-v2v work

● IMS: Integrated with ansible + virt-v2v+more
  ○ IMS general overview
  ○ Short video demo
Background and why v2v

● Digital transformation produces better outcomes
● Cloud is integral to every enterprise digital transformation strategy
● Choose the right cloud model: open standards
● For those workloads on VM supported by proprietary hypervisor, need easily migrate to open standard: KVM
● Virt-v2v converts guests from a foreign hypervisor to KVM
Virt-v2v: short overview

- Tool to automate VM migrations to KVM/RHV/OPENSTACK
- Migrate to KVM, RHV or OPENSTACK from
  - VMWare
  - XEN
- Installs virtio drivers and reconfigures machine
- Can be scripted for bulk operations
- It is open source tool, http://libguestfs.org/virt-v2v.1.html
What virt-v2v can do

-virt-v2v

Conversion server

-i disk
-i ova
-VMware
-Xen
...
-i libvirtxml
-i vmx

-o null
-o local
-o qemu

-o libvirt
(default)

KVM

-o glance
-o openstack
-o rhv
-o vdsdm
-o rhv-upload

#redhat #rhsummit
## Input and output modes

### Source

<table>
<thead>
<tr>
<th>Type</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vcenter</td>
<td>-ic vpx://root@Vcenter/data/ESXi/?no_verify=1 VM</td>
</tr>
<tr>
<td>OVA</td>
<td>-i ova</td>
</tr>
<tr>
<td>VDDK</td>
<td>-ic vpx://root@vcenter/Data/esxi?no_verify=1' -it vddk</td>
</tr>
<tr>
<td>ESXi</td>
<td>-ic esx://root@esxi.example.com?no_verify=1 guest</td>
</tr>
<tr>
<td>VMX</td>
<td>-i vmx(An external NFS storage attach to ESXi) vm.vmx</td>
</tr>
<tr>
<td>SSH</td>
<td>-i vmx -it ssh (ESXi storage is a local storage on ESXi server)</td>
</tr>
<tr>
<td>XEN</td>
<td>-ic xen+ssh://root@xen.example.com.guest_name</td>
</tr>
</tbody>
</table>

### Target

<table>
<thead>
<tr>
<th>Type</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>KVM</td>
<td>-o local / -o qemu / -o libvirt</td>
</tr>
<tr>
<td>RHV</td>
<td>-o rhv -os nfs/export</td>
</tr>
<tr>
<td>RHV</td>
<td>-o vdsr</td>
</tr>
<tr>
<td>RHV</td>
<td>-o rhv-upload (in rhel8)</td>
</tr>
<tr>
<td>Openstack</td>
<td>-o glance</td>
</tr>
<tr>
<td>Kubevirt</td>
<td>-o openstack</td>
</tr>
<tr>
<td>Kubevirt</td>
<td>...</td>
</tr>
</tbody>
</table>
How virt-v2v work

Getting virt-v2v utility:

- Yum or dnf install virt-v2v:
  - libguestfs
  - libvirt
  - qemu-kvm
  - virtio-win
  - ...
- After that, launch it from command line like:
  - virt-v2v -ic \nnpx://root@10.73.73.xx/data/10.73.75.xx/?no_verify=1 $guest \n  -o openstack -oo server-id=v2v-vm
Conversion process

Open the source

- Use libvirt to get the guest's metadata
  - `#virsh -c 'vpx://root@10.73.73.xx/data/10.73.75.xx/?no_verify=1' dumpxml $guest`

Create overlay

- Creating an overlay to protect the source from being modified
  - `#qemu-img 'create' '-q' '-f' 'qcow2' '-b' 'json: { "file.cookie": "vmware_soap_session="1669faee540ea1383765385b06614035acd2ce9\"", "file.sslverify": "off", "file.driver": "https", "file.url": "https://10.73.73.xx/folder/esx6.7-win7-i386/esx6.7-win7-i386-flat.vmdk?dcPath=data&dsName=esx6.7", "file.timeout": 2000 }' '-o' 'compat=1.1,backing_fmt=raw' '/var/tmp/v2vovl0ee665.qcow2'`
Initialize the target

- Mount storage domain to conversion host server
  - `#mount '10.66.144.xxx:/home/nfs_export' '/tmp/v2v.Wzj4E8' on v2v conversion server`

Install drivers

- Use `libguestfs` to modify `overlay.qcow2` to update config files and copy drivers
  - `# copy '/usr/share/virtio-win/virtio-win.iso:NetKVM/w7/x86/netkvm.cat' -> '/Windows/Drivers/VirtIO/netkvm.cat'`

Copy converted overlay.qcow2

- Use `qemu-img convert` to copy `overlay.qcow2` to target storage
  - `qemu-img 'convert' '-p' '-n' '-f' 'qcow2' '-O' 'raw' '/var/tmp/v2vovl0ee665.qcow2' '/tmp/v2v.Wzj4E8/c1198a52-cfac-46e0-9972-e13417dec3d3/xx'`
Example usage: migrate from Vmware to RHV

```
virt-v2v -ic vpx://vcenter.example.com/Datacenter/esxi vmware_guest \
-o rhv-upload -oc https://ovirt-engine.example.com/ovirt-engine/api \
-os ovirt-data -op /tmp/ovirt-admin-password -of raw \
-oo rhv-cafile=/tmp/ca.pem -oo rhv-direct --bridge ovirtmgmt
```
IMS: infrastructure migration solution

- Integrate virt-v2v, ansible and more
Ansible: unify provisioning, configuration, deployment

Simple
- Human readable automation
- No special coding skills need
- Tasks executed in order
- Usable by every team
- Get productive quickly

Powerful
- App deployment
- Configuration management
- Workflow orchestration
- Network automation
- Orchestrate the app lifecycle

Agentless
- Agentless architecture
- Uses OpenSSH & WinRM
- No agents to exploit or upgrade
- Get started immediately
- More efficient & more secure
Demo
THANK YOU

linkedin.com/company/Red-Hat
youtube.com/user/RedHatVideos
facebook.com/RedHatInc
twitter.com/RedHat