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# How to migrate to a new-age IT stack with KVM



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# How to migrate to KVM

- Present a method to migrate from traditional hypervisors to KVM
- Optimized process, using only open source tools
- Live demo: Migrate a Windows VM from VMware to KVM
- Q & A



# Why KVM ?

## Positives

- Modern "new age" IT stack
- The best for cloud-native applications and cloud platforms (K8S, OpenStack)
- Flexibility, Optimization - do what you need how you need it
- No vendor lock-in
- No vendor license fees

## Same

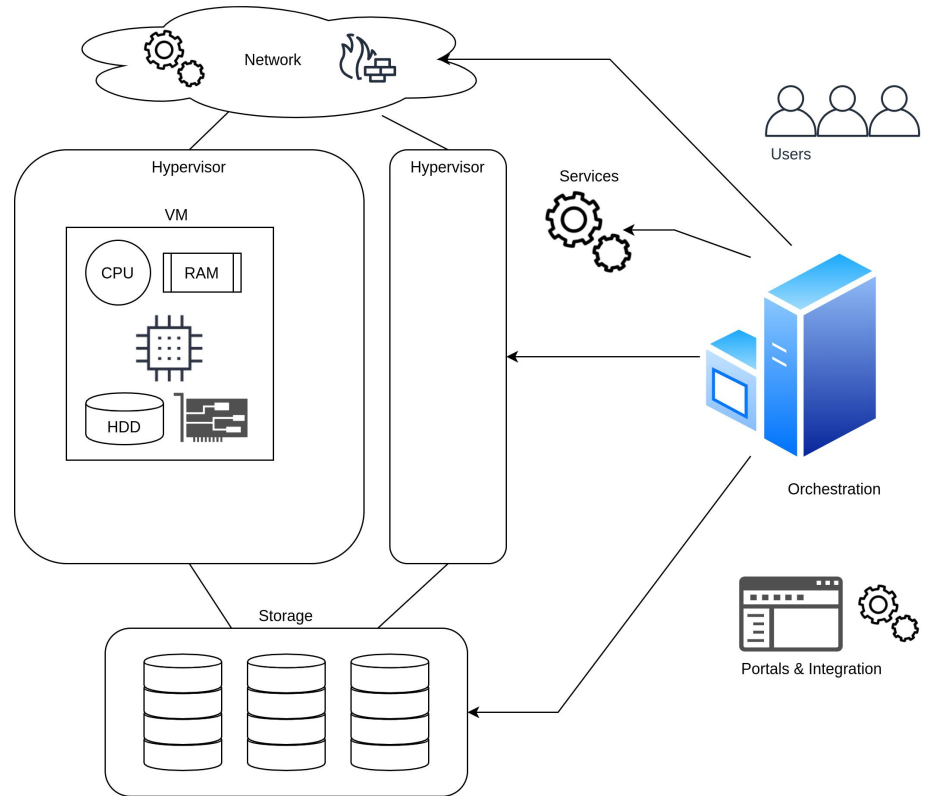
- Commercial vendor support, if needed

## Drawbacks

- Requires Linux know-how
- Less-developed support matrix
- Perhaps too much choice

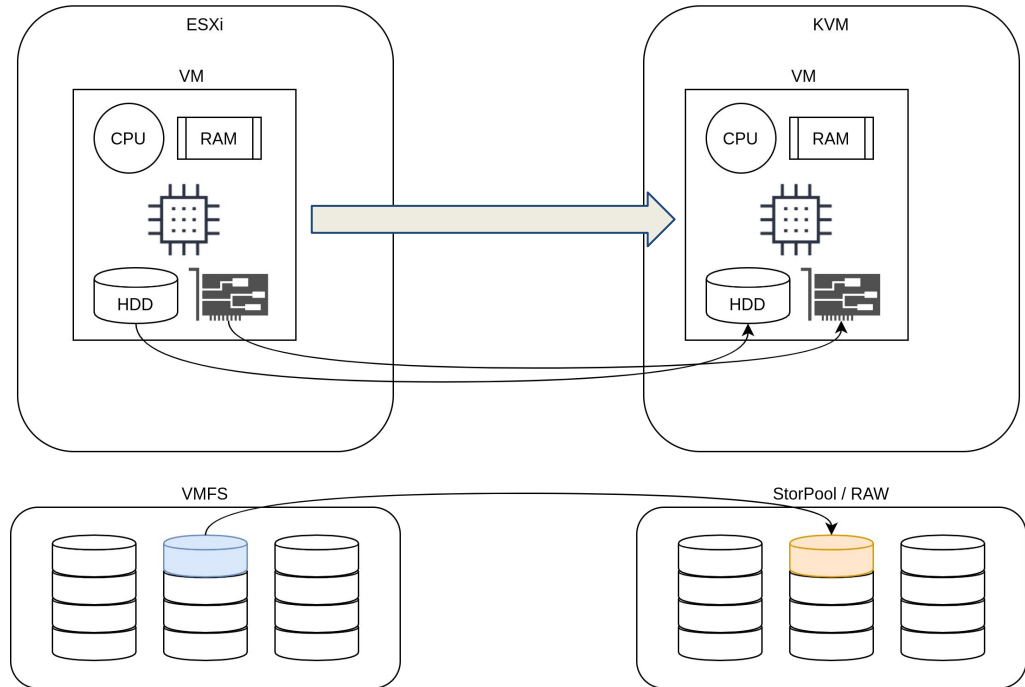
# A Migration Project

- Virtual machines configuration
  - vCPU, RAM
  - Virtual Disks
  - NICs
  - Other Virtual Hardware
- Disk images
- Storage settings - QoS, ACL, etc.
- Virtual Networks
  - VLANs, IP addresses, reservations
  - Firewall rules
  - Services - DNS, DHCP, Load balancers, etc.
- Users, access control, ...
- Service definitions
- UI, Integration with 3rd party (billing), CI/CD, k8s,
- Other services - e.g. DR, Backup,



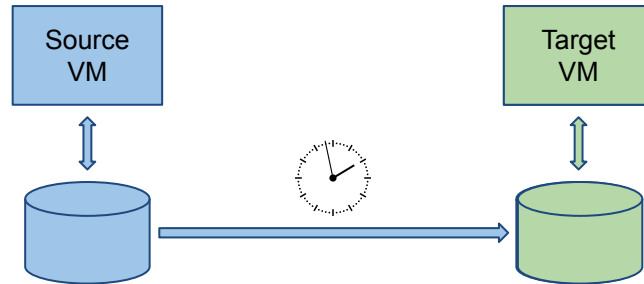
# Today we'll do

- Hypervisor  
ESXi / vCenter → KVM / OpenNebula
- Storage  
vmdk image / VMFS / Shared iSCSI →  
raw image / shared block (StorPool)
- Guest OS - Windows Server 2019
- Guest drivers:  
Disk: LSI Logic SAS → virtio-scsi  
NIC: Intel E1000e → virtio-net



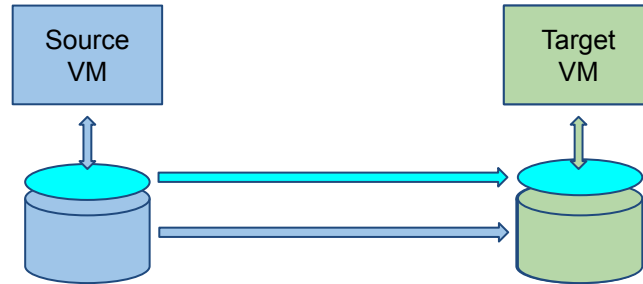
# The Usual Approach

1. Convert VM metadata and define a new VM at the target hypervisor
2. **Stop the VM at the source hypervisor**
3. Copy the disk images from the source to the target hypervisor
4. Convert the VM disk image format
5. OS morphing - update settings, install drivers for the new emulated hardware, etc.
6. **Start the VM at the target hypervisor**

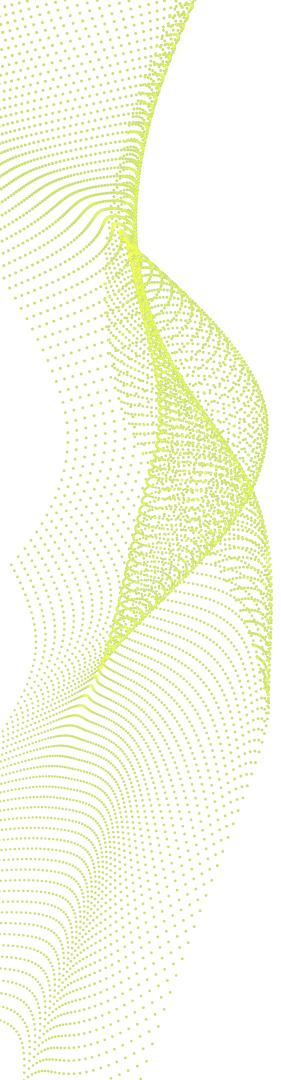


# How Can We Improve It

1. Define a new VM at the target hypervisor
2. Take a snapshot
3. Transfer the image
4. Stop the source VM
5. Transfer the snapshot image
6. Apply the snapshot on the target image
7. OS morphing
8. Start the target VM







# Demo

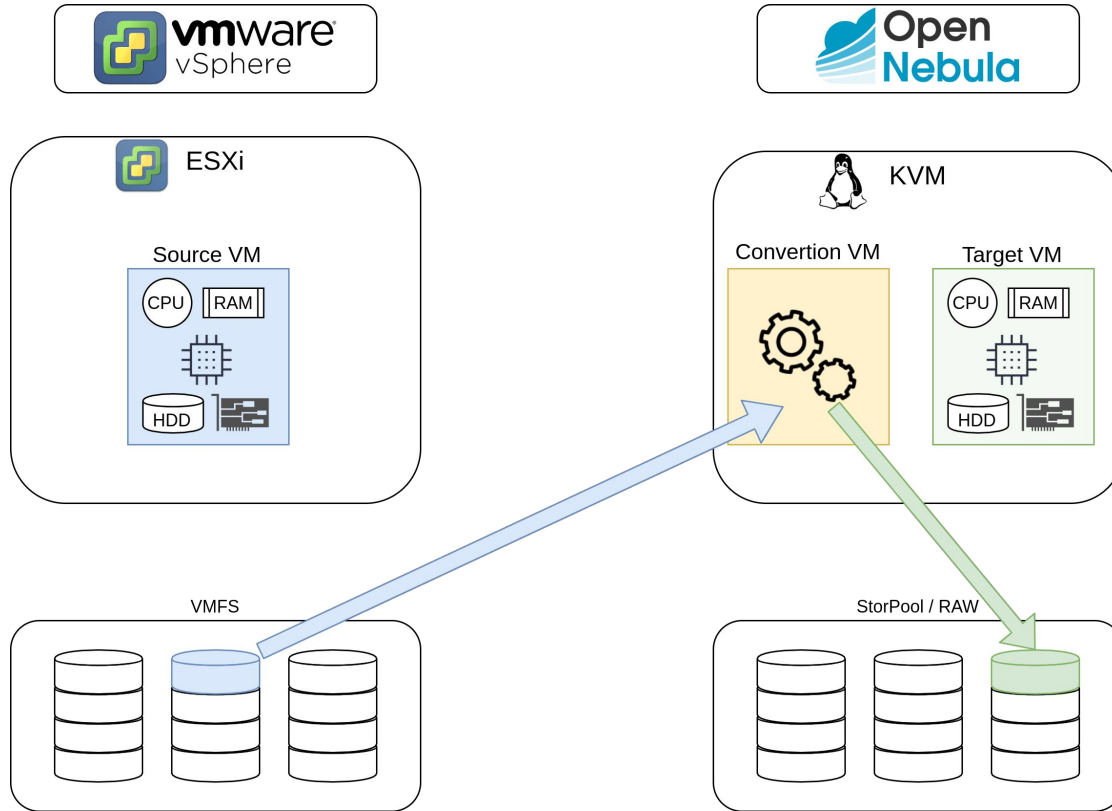
# Tools

- **qemu-img**: use the package supplied by the Linux distro
- **sesparse**: Open source tool to read and process vmdk images.

<https://github.com/storpool/any2kvm>

- **virt-v2v**: <http://download.libguestfs.org>

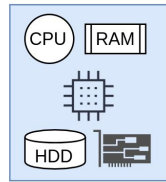
# The Demo Setup



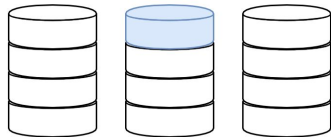
# The Demo Setup



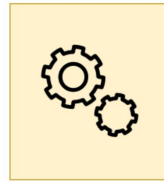
Source VM



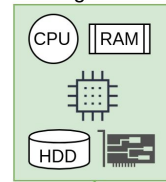
VMFS



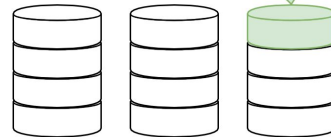
Conversion VM



Target VM



StorPool / RAW





# Steps

1. Define a new VM at the target hypervisor
2. Take a snapshot of the VM disks on the source hypervisor
3. Copy the disk image to the target hypervisor
4. Convert the VM disk image format
5. Stop the VM at the source hypervisor
6. Copy the snapshot image to the target hypervisor
7. Apply the snapshot image to the target image.
8. OS morphing
9. Start the VM at the target hypervisor



# Other Supported Hypervisors

- VMWare
- MS Hyper-V
- Citrix XenServer
- Anything that can create snapshots in separate files

## Tools

Available at <https://github.com/storpool/any2kvm>

- **sesparse, vhdx, vhd** - tools to read vmdk, vhdx and vhd image formats and apply snapshots.
- Scripts to automate the process
- Patch for virt-v2v for Windows guests



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**Q&A**

**Thank you!**



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**Download a Step-by-Step Guide:**  
**How to Migrate to a New-Age IT Stack with KVM**

**<https://storpool.com/how-to-migrate-to-kvm>**





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