

KVM vSphere: Create and Manage Your Own VM Lab

Check GitHub for helpful DevOps tools:

Michael Robotics

Hi, I'm Michal. I'm a Robotics Engineer and DevOps enthusiast. My mission is to create skill-learning platform that combats information overload by adhering to the set of principles: simplify, prioritize, and execute.

 <https://github.com/MichaelRobotics>



Ask Personal AI Document assistant to learn interactively (FASTER)!

1


Download PDF

1

<https://github.com/MichaelRobotics/DevOpsTools/blob/main/KVMvSphere.pdf>

2

Go to website

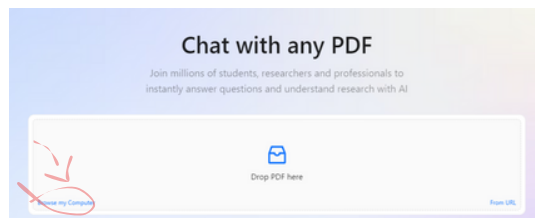
 | Click there to go to ChatPdf website

2

3

Browse file

3



4

Chat with Document

Ask questions about document!

4

Completely new to VM's and Networking?

If you are completely new to this topic, using a document assistant to understand the many definitions can be helpful. However, the best way to start is by watching this video, which I believe provides the best explanation for beginners starting their journey with Linux and virtualization:

QEMU/KVM for absolute beginners

On this episode of Veronica Explains, I explain the absolute basics of hypervisors generally, KVM specifically, and virt-manager graphically.

 <https://youtu.be/VeronicaExplains>



Essential for this PDF is a thorough knowledge of networking. I highly recommend the HTB platform's networking module, which offers extensive information to help build a comprehensive understanding.

HTB - Your Cyber Performance Center

We provide a human-first platform creating and maintaining high performing cybersecurity individuals and organizations.

 <https://www.hackthebox.com/>



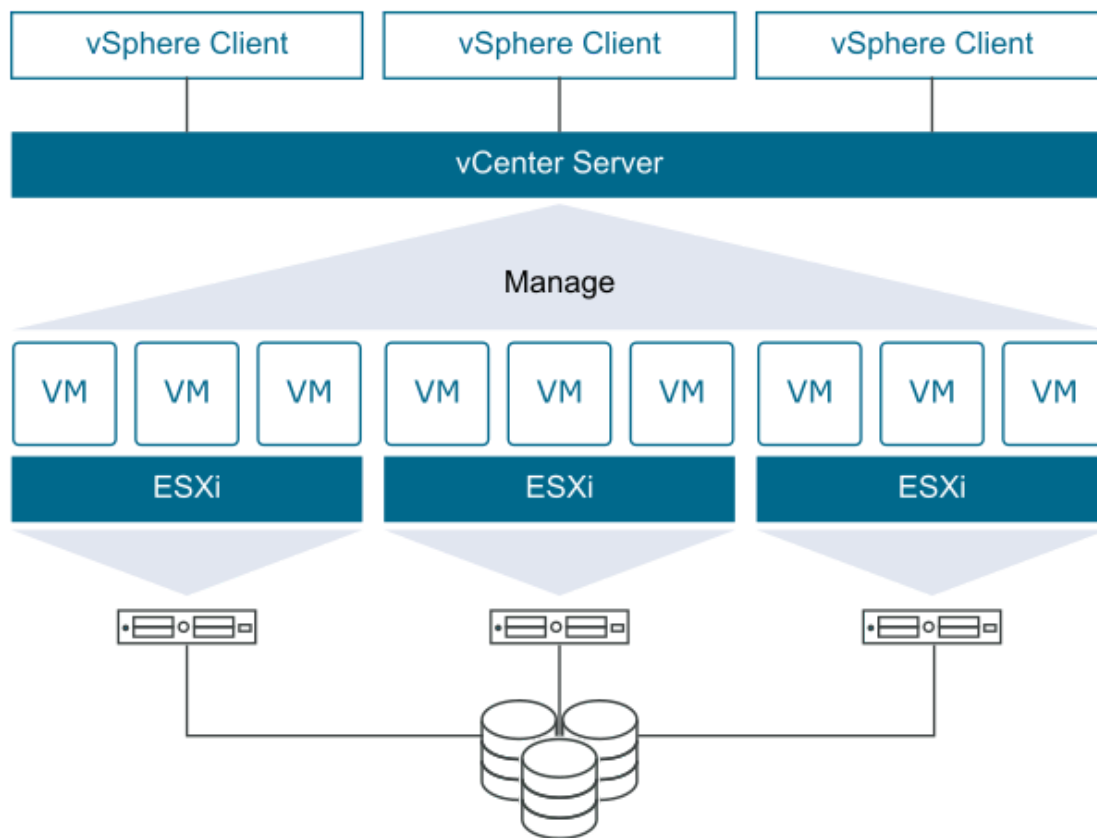
What is vSphere ?

vSphere is VMware's platform that provides virtualization and management tools for data centers. It allows organizations to create and manage virtual machines, optimize resource allocation, and ensure high availability and scalability of IT infrastructure.



How vSphere works?

vSphere works by using a hypervisor, known as VMware ESXi, to create and manage multiple virtual machines on a single physical server. Through its management layer, vCenter Server, it provides centralized control for provisioning, monitoring, and optimizing these virtual machines, ensuring efficient use of hardware resources and maintaining system reliability.



KVM vSphere: Why and When

KVM integration with vSphere is ideal for environments where organizations seek to leverage the flexibility of KVM virtualization within the vSphere management framework. This approach combines KVM's open-source benefits with vSphere's robust management and automation capabilities, making it suitable for diverse workloads and scalable infrastructure.

Typical Use Case: Using KVM to run vSphere environments on a local machine for learning and development purposes, such as installing ESXi as a virtual machine. This setup allows users to experiment with vSphere's features and configurations in a cost-effective and controlled environment.

System Requirements

- 32 gb ram
- 100 free gb storage
- ubuntu 22.04

If you want to install it on a different Linux distro, ask in the comments and I will write an Ansible playbook or bash script.

KVM vSphere: Main components & packages

- libvirt-daemon - runs virtualization in background
- qemu-kvm – An opensource emulator and virtualization package that provides hardware emulation.
- virt-manager – A Qt-based graphical interface for managing virtual machines via the libvirt daemon.
- libvirt-daemon-system – A package that provides configuration files required to run the libvirt daemon.
- virtinst – A set of command-line utilities for provisioning and modifying virtual machines.
- libvirt-clients – A set of client-side libraries and APIs for managing and controlling virtual machines & hypervisors from the command line.
- bridge-utils – A set of tools for creating and managing bridge devices.

KVM vSphere: Configure Networks

1) Install KVM on hosts

I've made a post with PDF about this. Follow instructions and then come back.

Kvm: Manage VM's like a PRO

Check GitHub for usefull DevOps tools



<https://github.com/MichaelRobotics/DevOpsTools/blob/main/KVMInstall.pdf>



2) Modify default KVM network

The VMs will have configured as DNS server : 192.168.122.1. This is the dnsmasq DNS/DHCP server associated with the default network. Modify **/etc/libvirt/qemu/networks/default.xml** file

```
<network>
  <name>default</name>
  <uuid>cedc08b7-e83d-48ae-9806-3b4de0481c7f</uuid>
  <forward mode='nat'/>
  <bridge name='virbr0' stp='on' delay='0'/>
  <mac address='52:54:00:62:d4:02'/>
  <domain name='home.lab'/>
  <dns>
    <host ip='192.168.122.121'>
      <hostname>esxi21.home.lab</hostname>
    </host>
    <host ip='192.168.122.120'>
      <hostname>vcenter.home.lab</hostname>
    </host>
  </dns>
  <ip address='192.168.122.1' netmask='255.255.255.0'>
    <dhcp>
      <range start='192.168.122.10' end='192.168.122.99'/>
    </dhcp>
  </ip>
</network>
```

After modifying this file, restart the default network with the command

```
$ virsh net-destroy default && virsh net-start default
```

If connectivity to VMs is lost after restarting the default network, an option is to restart the libvirtd service

```
$ sudo systemctl restart libvirtd.service
```

3) Edit /etc/hosts to add DNS entries

```
(...)  
# vSphere 7.0 lab  
192.168.122.120 vcenter vcenter.home.lab  
192.168.122.121 esxi21 esxi21.home.lab  
(...)
```

KVM vSphere: Download ISO

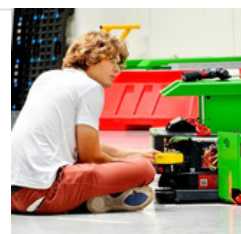
1) Ask me for ESXi and vCenter files in DM :)

Michał Nowakowski

DevOps/SysOps | Robotics Engineer | R&D



<https://www.linkedin.com/in/micha%C5%82-nowakowski-3b9431253/>



2) mv ISO files to folder:

```
mv VMware-VCSA-all-7.0.3-24026615.iso /var/lib/libvirt/images
```

```
mv VMware-VMvisor-Installer-7.0U3n-21930508.x86_64.iso /var/lib/libvirt/images
```

KVM vSphere: Create ESXi vm

1) execute virt-install command

```
$ virt-install --virt-type=kvm --name=esxi21 --ram 20000 --vcpus=4 --virt-type=kvm --hvm  
--cdrom /var/lib/libvirt/images/VMware-VMvisor-Installer-7.0U3n-21930508.x86_64.iso --  
network network:default,model=vmxnet3 --graphics vnc --video qxl --disk  
pool=default,size=10,sparse=true,bus=ide,format=qcow2 --disk  
pool=default,size=30,sparse=true,bus=ide,format=qcow2 --boot cdrom,hd --noautoconsole  
--force --cpu host
```

2) Enter installation GUI

```
$ virt-viewer esxi21 &
```

Follow **ESXi Installation Progress** from GitHub post on which i base this PDF

vSphere 7 - Nested Lab on Linux / KVM

This document describes the deployment of a basic vSphere 7 lab hosted in a nested Linux KVM environment.



<https://github.com/MichaelRobotics/DevOpsTools/blob/main/KVMInstall.pdf>



KVM vSphere: Install vCenter in ESXi

1) Mount vCenter installer

```
# Create mount point

$ sudo mkdir /mnt/vcenter

# Mount iso to mount point

$ sudo mount -o loop /var/lib/libvirt/images/VMware-VCSA-all-7.0.3-24026615.iso /mnt/vcenter/
```

2) Execute vCenter installer

```
$ cd /mnt/vcenter/vcsa-ui-installer/lin64
$ ./installer
```

Follow **Installing vCenter in esxi21** from GitHub post on which i base this PDF

vSphere 7 - Nested Lab on Linux / KVM

This document describes the deployment of a basic vSphere 7 lab hosted in a nested Linux KVM environment.



<https://github.com/MichaelRobotics/DevOpsTools/blob/main/KVMInstall.pdf>



Common troubleshooting

1) Cannot mount the ISO image

Check if ISO downloaded properly - does it have right size?

2) Cannot finish vCenter installation

Possible DNS issues, great thread to look for answers:

vCSA6.5 Installation Stuck at 80%

if you came across this post then you'll probably had the problem that the vCenter

 <https://www.dedoimedo.com/computers/kvm-troubleshooting.html>



3) Check the nmcli man page

4) If everything is a complete mess

Remove the bridge and revert the configuration to its previous state.

KVM bridged mode: How to remove

1) Remove KVM

Follow my KVMInstall PDF remove KVM section:

Kvm: Manage VM's like a PRO

Check GitHub for usefull DevOps tools



<https://github.com/MichaelRobotics/DevOpsTools/blob/main/KVMInstall.pdf>



Delete ESXi VM. Use virt-manager or CLI

Learn more about KVM

Check RedHat, they have great docs

Virtualization Deployment and Administration Guide

Installing, configuring, and managing virtual machines on a RHEL physical machine

<https://docs.redhat.com/en>



Share, comment, DM and check GitHub for scripts & playbooks created to automate process.

Check my GitHub

Michael Robotics

Hi, I'm Michal. I'm a Robotics Engineer and DevOps enthusiast. My mission is to create skill-learning platform that combats skill information overload by adhering to the set of principles: simplify, prioritize, and execute.



<https://github.com/MichaelRobotics>



PS.

If you need a playbook or bash script to manage KVM on a specific Linux distribution, feel free to ask me in the comments or send a direct message!