Test/Dev Lab Virtualization

Jeremy Ey

Systems Administrator – Information Technology Services

Tennessee Tech Computer Science Alumni BS '05, MS '07

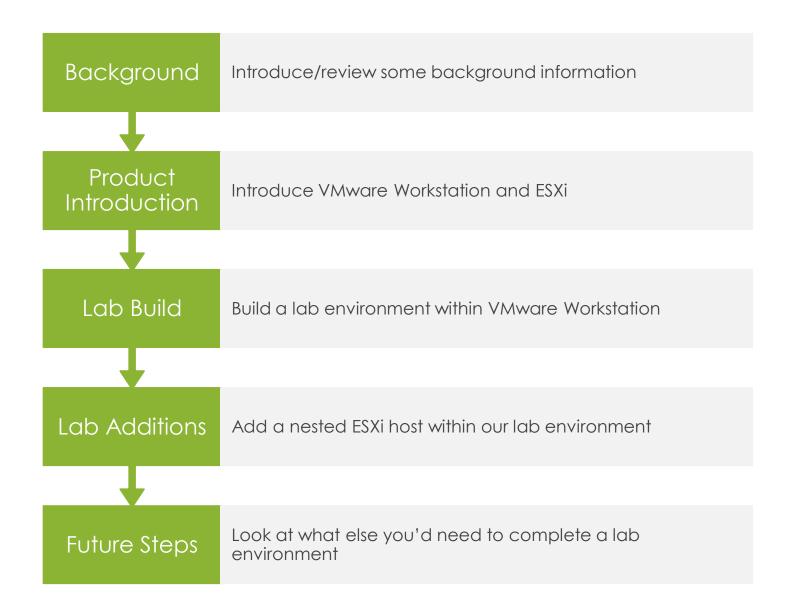
VCIX6-DTM, VCP6-DCV

twitter: @kayakerscout

blog: https://quirkyvirtualization.net

Motivations

- Knowledge of VMware products (i.e. vSphere)
- Knowledge of a multi-system environment
- Testing of platforms configurations other than primary system
- Curiosity about how something works or "what happens if?"



Tonight's Plan

Background

IP Addressing

- Private Address Ranges:
 - 10.0.0.0/8
 - 172.16.0.0/12
 - 192.168.0.0/16

IP Addressing

- Routing
- Network Address Translation

What is a Virtual Machine

- virtualization, not emulation
- virtual devices
- leaky abstractions

VMware Workstation

VMware Workstation

- Windows or Linux based host
- Fusion is the MacOS product

VMware Workstation

- host OS is responsible for dealing with physical hardware
- run as continuously or a ad hoc as you'd like

VM in VMware Workstation

Let's Build a VM in VMware Workstation

VMware ESXi and vSphere

ESXi

- dedicated hypervisor, runs directly on the hardware
- as such your hardware must be "supported" by ESXi to use it
- assumes you have a functional network to access management
 - web based or API based

vSphere

- vSphere is largely the combination of ESXi and vCenter
- vCenter provides centralized management

General Notes

- Processor
- Memory
 - more memory = doing more concurrently
 - overcommitment Edit > Preferences > Memory (workstation)
 - ESXi swap file
- Storage
 - storage matters performance vs capacity
 - thin vs thick provisioning

Common Features

- snapshots saved state of a virtual machine
- clones full clones, linked clones

VMware Tools

- installed in Guest OS
- drivers and other packages to make the guest OS more usable
- expands management options
- provides time synchronization following key events
- provided as an freestanding executable installer, and iso image
- Linux guests: open-vm-tools package(s)

VMware Tools

Check on Guest VM

Networking

- Bridged
- NAT
- Host-Only

Lab Architecture

- Build everything inside of VMware workstation, including an ESXi host
- Lowest barrier of entry
 - start with what you have
 - broader hardware support

Network Management within Workstation

look at defaults for each network

Lab Design One

- two guests, start with NAT to complete install
- then place on host only network

Lab Design Two

 two guests in their own host only networks, place a "router" inbetween

Routing Problems

ESXi Install

- installing ESXi assuming you don't have hardware issues
- configuring management

vCenter Install

 Virtual appliance, deploys into a ESXi host or existing vSphere environment (VCSA)

Future Lab Additions

- DNS/DHCP/NTP
- Shared Storage
- Active Directory

DNS/NTP/DHCP

essential network services

Shared Storage

Shared storage

Directory Services

- Active Directory
- OpenLDAP

Pointers

- As you're getting started, don't get too invested in any one decision.
- Come up with a naming scheme for your "generic VMs" before you need them.

Pointers

- Decide what is important to you.
- Probably can't always follow "Best Practices" and production deployment techniques

- vBrownBag "weekly" podcast/webinar https://vbrownbag.com
- VMware Users Group (VMUG) in-person & online community https://www.vmug.com
- Communities online, in-person
 - example: http://blogtober.net/

- VMTN Blog Beat Aggregated Blog Feed https://blogs.vmware.com
- VMware Technology Network (VMTN) https://communities.vmware.com
- VMware Hands on Labs https://hol.vmware.com
- VMware Product Trials https://www.vmware.com/try-vmware.html

- Microsoft Evaluation Center https://www.microsoft.com/en-us/evalcenter/
- Microsoft Virtual Machines
 https://developer.microsoft.com/en-us/microsoft-edge/tools/vms/

- Safari Books Online via Tennessee Tech library
- Professional and Student members of ACM [not chapter membership] have access to the ACM Learning Center includes full Safari Books Online

• Storage:

FreeNAS http://www.freenas.org
 DellEMC UnityVSA https://www.emc.com/products-solutions/trial-software-download/unity-vsa.htm

Routers:

VyOS https://vyos.io/, pfsense https://www.pfsense.org/

Conclusion/Door Prizes