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Setting Up a Test Lab With Hyper-V

Agenda

- A little about me
- Sample Lab Design
- What is virtualization and why would I use it?
- Virtual Networks, Memory, and Disks
- Enabling Hyper-V
- Managing Virtual Machines
- Create and Install the Lab
- Additional Topics
- Other Hypervisor Options
- Resources
- Questions

You too can, and should, speak at events like this

"Everyone you will meet knows something you don't... Respect their knowledge and learn from them. It will bring out the best in all of you."

- Bill Nye during Morning Commencement at UMASS Lowell 2014

"Everyone in this room knows something someone else in the room doesn't. Share it."
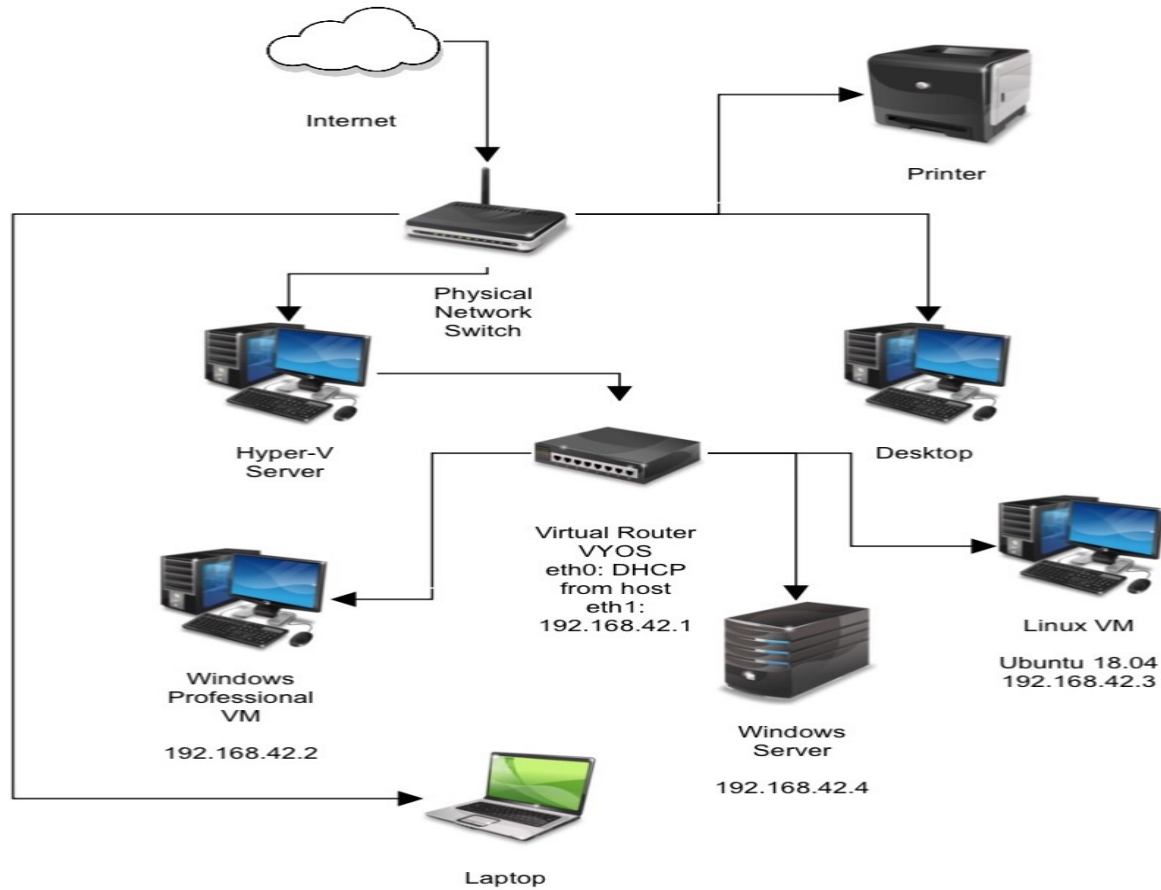
- Jay's corollary to Bill Nye

A Little About Me

- Worked as night shift computer operator in high school
- Application developer for a large state agency
- Mainframe system programmer at two large state agencies
- DBA and developer for State Parks Reservation System
- Transitioned into Healthcare IT in 1996
- Total paradigm shift in late 2018: Advertising Software

CISSP Certified Information Systems Security Professional

CSCS CERTIFIED SECURITY COMPLIANCE SPECIALIST

FRIEND OF redgate 2019

CCSA Certified Cyber Security Architect

HCISPP HealthCare Information Security and Privacy Practitioner

Sample Lab Design

Internet

Printer

Physical Network Switch

Hyper-V Server

Desktop

Virtual Router VYOS
eth0: DHCP from host
eth1: 192.168.42.1

Windows Professional VM

192.168.42.2

Windows Server

192.168.42.4

Linux VM

Ubuntu 18.04
192.168.42.3

Laptop

What is virtualization and why would I use it?

- What is virtualization?
- Why would I use it?
  - Learn new technologies
  - Test new physical hardware design
  - Application performance testing
  - Reduce physical footprint and financial outlay

Hyper-V Architecture

Host Operating System	Guest VM	Guest VM	Guest VM	Guest VM

Hypervisor

Physical Server Hardware
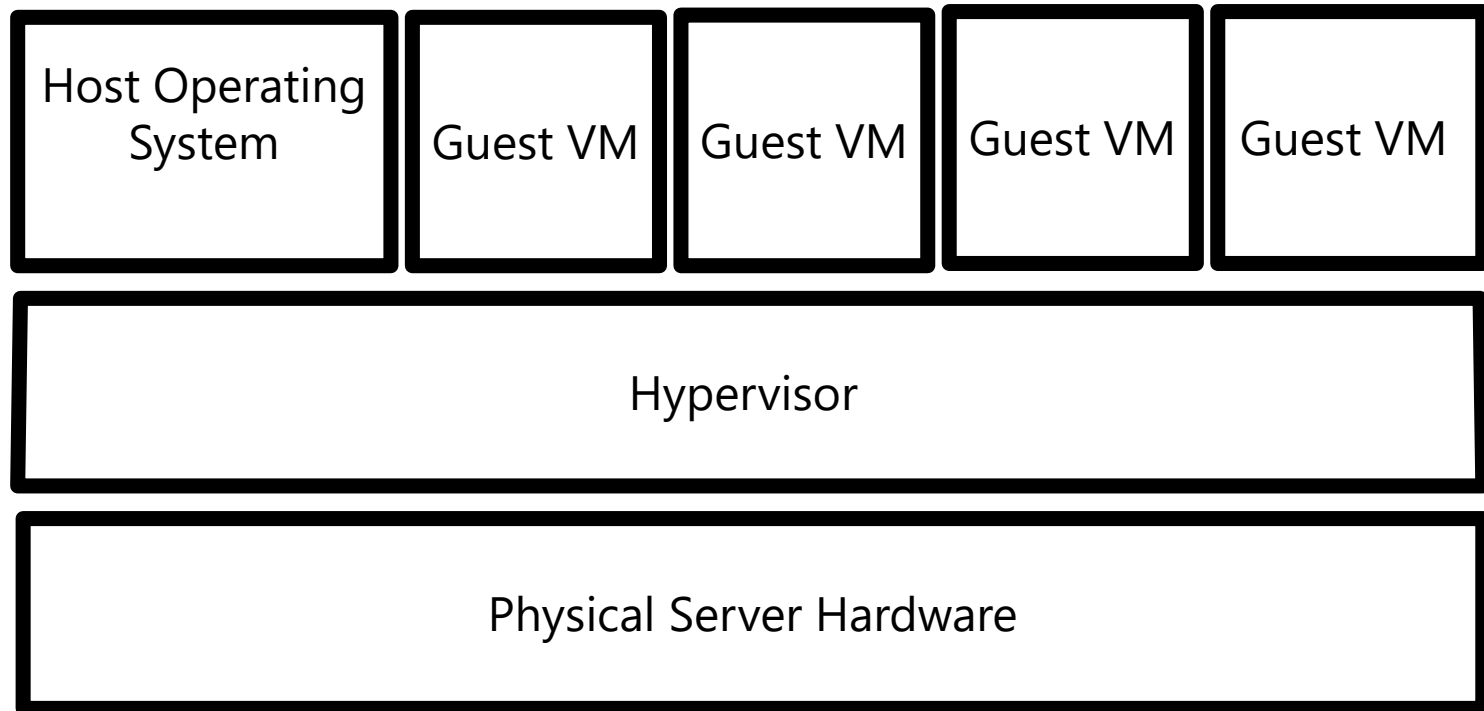
Virtual Networks, Memory, and Disks

- Virtual Networks
  - External
  - Internal
  - Private
- Virtual Memory
  - Static
  - Dynamic
- Virtual Disks
  - Fixed-size Disks
  - Dynamically Expanding Disks
  - Differencing Disks

Enabling Hyper-V

- Requirements for Windows 10
  - Enterprise, Professional, or Education
  - 64-bit processor with Second Level Address Translation (SLAT)
  - CPU support for VM Monitor Mode Execution (Enabled in BIOS/UEFI)
  - Minimum 4GB memory
- Control Panel Method (demo)
- PowerShell Method

Managing Virtual Machines

- Hyper-V Management Console
- PowerShell

Create and Install the Lab

- Virtual Router
    - Install and Configure VYOS (demo)
- Windows Server
    - Create new VM from existing VHDX (demo)
- Windows 10 Desktop
    - Create new VM from existing VHDX (demo)
- Linux (Ubuntu 18.04) Desktop
    - Create new VM from existing VHDX (demo)

Additional Topics

- PowerShell and VM creation/maintenance
- Converting VMWare VM to Hyper-V VM

Other Hypervisor Options

- Free/Open Source
  - Type 1 (bare metal)
    - Linux KVM
    - VMWare free ESXi
    - Xen
  - Type 2 (run on host OS)
    - Oracle VirtualBox
    - VMWare Workstation Player
    - Lguest
    - Linux Containers/Docker
    - Linux-VServer

Other Hypervisor Options (continued)

- Commercial
  - Type 1 (bare metal)
    - VMWare ESX and ESXi
    - Microsoft Hyper-V
    - Citrix XenServer
    - Oracle VM
  - Type 2 (run on host OS)
    - VMWare Workstation/Fusion/Player
    - VMWare Server
    - Red Hat Enterprise Virtualization
    - Parallels Desktop

Resources

- Operating Systems
  - Red Hat Enterprise - Developer Edition
  - SUSE
  - Ubuntu (server)
  - Windows Server (180 day eval)
  - Windows 10 Enterprise (90 day eval)
- Books and Articles
  - Pro Microsoft Hyper-V 2019
- Online training
  - Pluralsight – Implementing Windows Server 2016 Hyper-V

Contact

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Questions

The floor is yours.