“Geek Out”: DIY vSphere 5.1 Lab

Hartford / CT VMware User Group
March 28th, 2013
Matt Kozloski
DiY vSphere Lab

·Goal: vSphere Lab which can simulate all features of vSphere, such as:
  ▪ HA
  ▪ DRS
  ▪ Distributed Virtual Switch
  ▪ vMotion / Storage vMotion
  ▪ Shared Storage
  **(most?) Portions of this are totally not supported by VMware**
  ▪ Licensing:
    • VMware's products come with 60-day eval
    • TechNet Subscription makes life easier to get Windows OS’s for guests
      • See DreamSpark for students
Two Methods

- VMware Workstation
  - Install on Windows or Linux

- VMware vSphere 5.1
  - Nested hypervisor support
VMware Workstation

· Pro’s
  - Works well for laptop/workstation installations, where you aren’t “dedicating” a workstation/server to your lab
  - Natively does Linked Clones
  - NAT/DHCP is already built-in
  - Less complicated

· Con’s
  - Inserting extra layer of OS, in an already lean lab
  - Sometimes NAT server needs to be restarted
  - Windows Updates not related to VMware Workstation
  - Not as cool as a nested hypervisor
VMware Workstation

- Install host OS (RHEL / CentOS / Windows 7 / Windows 2008 R2)
- Install VMware Workstation
- Copy ISO images over
- Install vSphere
- Install vCenter
  - Consider installing vCenter outside of vSphere cluster, for accessibility reasons

- **Recommend at least 8-10GB of RAM**
  - Try using: “Fit all virtual memory in reserved host RAM” but watch for swapping of other apps
VMware vSphere 5.1

· Pro’s
  ▪ Lean install – you can install it on a USB stick and use your HDD’s for VMFS
  ▪ Pure vSphere – no traditional OS between you and the hardware
  ▪ Very stable
  ▪ Cool to show off nested HV support to your friends and family

· Con’s
  ▪ Requires Intel EPT or AMD RVI for 64-bit nested guests
  ▪ Not “officially” supported
VMware vSphere 5.1

- Check for Nested HV support
- Configure networking
- Install vSphere 5.1 on host system
  - You can install it on a USB stick
- Enable Nested HV support
- Install ancillary items on host system
  - NAT router / firewall
  - “Jump” box
    - Windows XP
- Install vSphere VMs on host system
- Create shared VMDKs for shared storage
VMware vSphere 5.1

- Check for Nested HV support:
  ```
  https://{host IP address}/mobl/?moid=ha-host&doPath=capability
  ```

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VMware vSphere 5.1

- Enabled Nested HV support
  - This allows you to successfully virtualize 64-bit VMs inside your nested vSphere hosts

- Using your favorite text editor (vi?), add:
  
  vhv.enable = "TRUE"

  to /etc/vmware/config
Networking: Private / “inside” subnet for NHV environment

- Benefit = portable “pod”
- Create two vSwitches:
  - Physical network (Public)
  - “Bubble” network (Private 58)
- Use a VM NAT router / firewall for traffic to/from your guests.
  - Demo using open-source Vyatta.
Networking: Promiscuous Mode

- Enable Promiscuous Mode on host system / “physical” vSwitch
  - Required for your nested VMs to have network connectivity
VMware vSphere 5.1

Network: Use E1000 Adapter for Nested vSphere host VMs!

- VMXNet3 is somewhat experimental on vSphere Nested HV (i.e. psod)
- Use E1000
- Can still use VMXNet3 in Nested HV guests, if you want
This is normal! You can continue!

You must present 2 CPUs and 2GB of RAM to each host; you can cut back the CPU to 1 after the build. Memory must stay at at least 2GB.
Shared Storage: VMware LSI Logic SAS!

- **VSA approach**
  - = Overhead on a slim environment

- **Shared SAS approach**
  - + No overhead
  - Enable “multi-writer” / use with LSI Logic SAS

  - [http://kb.vmware.com/...externalId=1034165](http://kb.vmware.com/...externalId=1034165)
  - ✔ Eager Zero Thick
  - ✔ Independent (you don’t want to snapshot these!)
VMware vSphere 5.1

- Build your VMs!
  - #1 Access vSphere Client from “Jump” machine’s console / RDP
  - #2 NAT translation to a VM “inside” the bubble network
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Shared Storage: SSD

- Performance

- Manual “Linked Clones”
  - (Optional – save disk space on SSD. If you want to rename VMDK's you will need to do that via SSH)
  - #1 Build your “base”
  - #2 Snapshot it
  - #3 Copy that snapshot X number of times
  - #4 Rename / Update -delta.vmdk files to reflect the parent image’s full path (kind of optional)
  - #5 “Use Existing” when building your VMs and select the –delta.vmdk file you copied as the VMDK

- The “base” is using 22GB and the “delta” for AD is using 1.16GB, so there is considerable advantage doing this with SSD.

- Be EXTREMELY careful with “Delete from Disk”, so you don’t delet the parent vmdk too!
VMware vSphere 5.1

What it looks like: Host System
VMware vSphere 5.1

What it looks like: Nested vSphere Cluster
Live Demo

- **RDP from HP Thin-client to Windows 7 VM hosted by nested vSphere**
  - Windows 7 VM has VMware Tools and **no** other optimizations

- **Setup:**
  - HP Thin-client w/ x-over cable to workstation
  - HP Z400
    - 1 quad-core Intel Xeon Processor
    - 20GB RAM
    - 2 x 7200RPM SATA
    - 1 x 160GB Intel 520-series SSD
    - 1 x 5GB USB stick