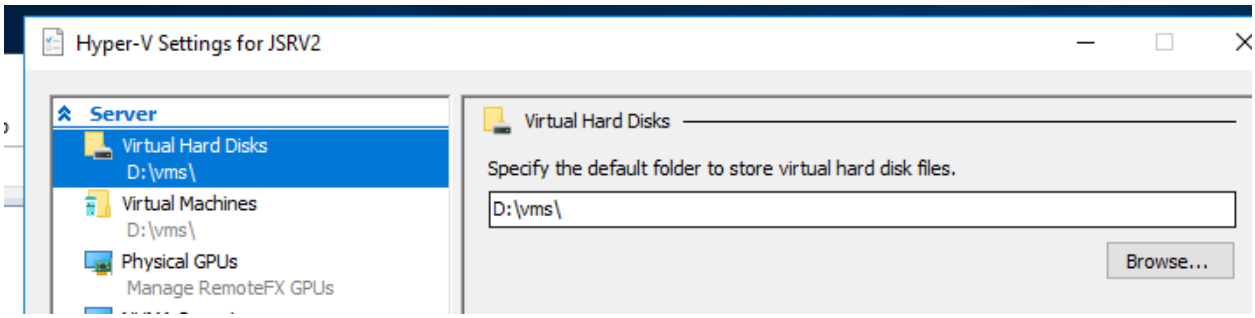
# Hyper-V Lab: Maintenance Utilities

*This lab incorporates different aspects of Hyper-V utilities, namely compacting virtual disks, setting checkpoints, setting up resource metering and enabling Linux Integration Services. You will submit four screenshots in Canvas, as noted below, as proof you have done this lab.*

**Part I Set the default directory for Virtual Machines**

1. If you have not already done so, set the default directory for holding your virtual machines and virtual disks. This is done by getting into the Hyper-V settings of the server. Browse to your ReFS volume and directory that you are using to store the VMs.




**Part II Compacting a Virtual Disk**

Compacting a dynamically expanding virtual hard disk helps recover fragmented disks, shrinking them in size. To compact, the virtual disk must not be in use, meaning the VM must be turned off.

1. Open Hyper-V Manager.
2. Turn Off the Windows VM, if not already done so.
3. Inspect the virtual hard disk for the VM. Note the size.
4. Browse to then **edit** the Virtual Hard Disk.
5. Choose Compact, then Finish.
6. Inspect the Windows virtual hard disk again. Compare from before. There may not be much difference if there hasn't been much disk activity. But at least you know how to do this. **Submit a screenshot of this second inspection check.**

**Part III Create a Checkpoint**

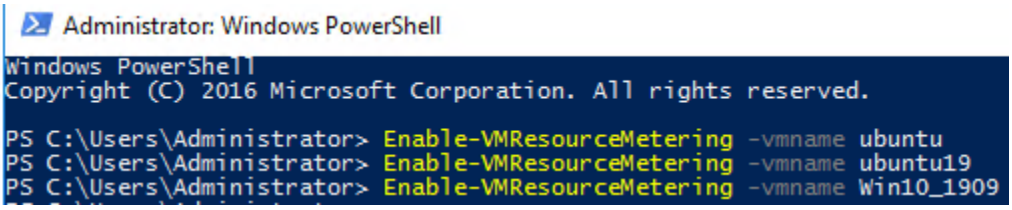
A checkpoint is a snapshot in time of a virtual machine.

7. Right click on one of your virtual machines. Select Checkpoint.
8. Note a successful checkpoint creation status in the Checkpoints pane.
9. Through file explorer, look in the same directory as the virtual hard disk. You should have an AVHDX file. **Submit a screenshot of the folder containing the AVHDX file.**

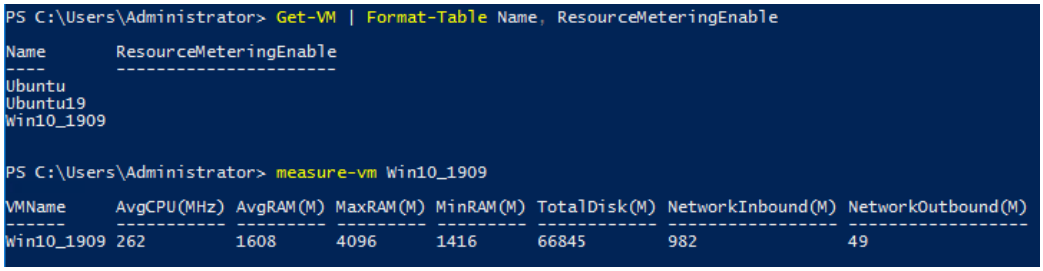
   *VHDX is the new Virtual Hard Drive file for Server 2012 and up. AVHDX is the differencing file that is created when you make a snap shot. When you delete the snap shot and power down the VM the files will merge after a minute or so. Depending on the size of the AVHDX it may take a few minutes to merge together.*

### Part IV Enable Resource Monitoring

10. Enable Resource Monitoring for each of your virtual machines. Do this through PowerShell.
11. In PowerShell run the following commands to enable Resource Monitoring:
    a. **Enable-VMResourceMetering –VMName <name of your VM>**




    b. After enabling it for all your VMs, verify that it is enabled with the following command:
        i. **Get-VM | Format-Table Name, ResourceMeteringEnable**
    c. Take a measure of your VM resources with the **measure-vm** command




## Submit a screenshot showing that Resource Metering has been enabled for all your VMs.

### Part V Enable Linux Integration Services (LIS)

12. Sign into your Linux VM.
13. Through sudo, edit **/etc/initramfs-tools/modules** with your favorite Linux text editor such as VI or Nano.
    a. Further details may be found at: *https://tizutech.com/installing-hyper-v-linux-integration-services-lis-with-ansible/*
14. Append the following lines:

    hv_vmbus
    hv_storvsc
    hv_blkvsc
    hv_netvsc

15. Save the file.
16. Run the following commands:
    a. **`sudo apt update`**
    b. **`sudo apt install linux-virtual linux-cloud-tools-virtual linux-tools-virtual`**
17. Then issue the following command: **sudo update-initramfs –u**
18. Reboot the virtual machine so these integration services register with the Linux kernel.
19. Check to see if the LIS drivers are loaded with this command: **lsmod**

## Submit a screenshot of the lsmod results showing the hv drivers loaded.