

# Shrinking a VHDX file containing an Ubuntu File System

## 1. Trim and Optimize VHDX

To prevent data loss when shrinking a volume, compact (otherwise known as defragment, or trim) the volume. This ensures that all data moves to the head of the volume. Note that the VHDX cannot parse an EXT4 file system; it can only remove blocks that contain all zeros so, this procedure will provide the VHDX Optimize function used later some help by writing zero's to unused blocks.

### Step I: Write the Zero's to Unused Blocks

Preferred Method: fstrim

- Works quickly
- Won't cause unnecessary wear on SSDs, but still works on 'spindles'
- Ships in the default tool set of Ubuntu
- Simple to use

From the Guest operating system, open a terminal and type:

```
sudo fstrim
```

If fstrim does not work, use only the following alternative method:

From the Guest operating system, open a terminal and type:

```
sudo dd if=/dev/zero of=~/zeroes  
sudo sync  
sudo rm ~/zeroes
```

### Step II: Optimize the VHDX

Exit the VM and shutdown, then launch PowerShell as Administrator:

```
PS C:\> Optimize-VHD -Path [path-to-file].vhdx -Mode Full
```

If the Ubuntu volume is already right-sized, but **ONLY** the VHDX needs to be shrunk, **skip to number 3.**

## 2. Resizing the Ubuntu Guest for Shrinking

- Download an Ubuntu Desktop ISO to the server
- Under the VHDX settings move the boot order to DVD first
- Set the DVD location to the ISO File
- Save and Start Ubuntu DVD VM
- Choose GParted from start menu
- Select partition and resize; ensure unallocated space is at end (right) of the partition(s)
- Exit Ubuntu

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## 3. Reduce the VHDX Size

- The VM must be in the Off state before proceeding
- Use `Get-VHD` to verify that `MinimumSize` is present and is smaller than the `Size`

```
PS C:\> Resize-VHD -Path '[path-to-file].vhdx' -ToMinimumSize
```

## 4. Repairing the Ubuntu File System after Resizing the VHDX

Resizing the VHDX will corrupt the Ubuntu boot system; the GPT table and MBR will become corrupt and Ubuntu will not boot; perform these steps to repair:

- Under the VHDX settings move the boot order to DVD first
- Set the DVD location to the ISO File
- Save and Start Ubuntu DVD VM
- Open a Terminal
- Enter `sudo gdisk /dev/sda`
- Choose `v` (verifies disk partitions displays errors)
- Choose `r` (access recovery commands)
- Choose `e` (fixes partitions)
- Select `Y`
- Choose `w` to write the fixes
- Select `Y`
- `sudo fdisk -l` (shows partitions recovered)
- Exit Ubuntu
- Under the VHDX settings move the boot order to DVD second with File first
- Save and Start VM