Creating a Bootable, Persistent USB Flash Drive

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What is Special About a Persistent USB Drive?

• Hard Drive Installation
  – Root partition
  – Additional partitions possible, can be auto-mounted

• Live CD/USB
  – Similar to a CD
  – Changes to root partition are lost on reboot
  – Additional partitions possible, cannot be auto-mounted

• Persistent USB
  – More like a hard drive
  – Original root partition fixed
  – Changes to root partition stored in persistent partition
  – Additional partitions possible, can be auto-mounted
What is Special About a Persistent USB Drive?

Hard Drive Installation

Root Partition

Swap

Additional Partition

Live USB

Root Partition

Additional Partition

Persistent USB

Root Partition

Persistent Partition

Additional Partition
Useful Command-Line Tools

- **fdisk**
  - Manipulate disk partitions
- **dd**
  - Write a file to a location, includes disks
- **parted**
  - Manipulate partitions
- **mkfs**
  - Make a filesystem
    - **mkfs.ext3** makes a Linux ext3 filesystem
- **mount and umount**
  - Mount and unmounts drives from the filesystem
Useful Graphical Tools

- **gparted**
  - Graphical version of parted
  - Much easier to use
  - Takes the place of fdisk, parted, mkfs, mount, and umount

- **unetbootin**
  - Create a bootable USB
  - Optional persistence

- **Some Linux distros have tools built-in**
Good Example in Kali Linux Procedure

• Create a Live USB First
• Download Linux image file
• Check hash code (md5, sha, pgp, etc.) for image file
• Determine USB Disk Device
  – Run `fdisk -l` to determine existing devices
  – Insert USB drive
  – Run `fdisk -l` again to see new drive
    • Probably `/dev/sdb` if 1 internal drive
    • Probably `/dev/sdc` if 2 internal drives, etc.
• Load disk image on USB drive
  – `dd if=kali-linux-1.1.0-amd64.iso of=<dev_from_above> bs=512k`
What Does It Look Like?

![GParted screenshot](image)

### Table

```
<table>
<thead>
<tr>
<th>Partition</th>
<th>File System</th>
<th>Mount Point</th>
<th>Label</th>
<th>Size</th>
<th>Used</th>
<th>Unused</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/sdc1</td>
<td>unknown</td>
<td>/dev/sdc1</td>
<td>Kali Live</td>
<td>2.78 GiB</td>
<td></td>
<td></td>
<td>boot, hidden</td>
</tr>
<tr>
<td>/dev/sdc2</td>
<td>fat16</td>
<td>/media</td>
<td>Kali Live</td>
<td>63.03 MiB</td>
<td>59.96 MiB</td>
<td>3.07 MiB</td>
<td></td>
</tr>
<tr>
<td>unallocated</td>
<td>unallocated</td>
<td>unallocated</td>
<td>unallocated</td>
<td>12.00 GiB</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

0 operations pending
Now, Create the Persistence

- [http://docs.kali.org/downloading/kali-linux-live-usb-persistence](http://docs.kali.org/downloading/kali-linux-live-usb-persistence)

- Determine how big the image file is
  - `read start < <(du -b -c kali-linux-1.1.0-amd64.iso | tail -1); echo $start`

- Set the end and create the partition
  - `end=7gb`
  - `parted <dev_from_step1> mkpart primary $start $end`

- Make the file system
  - `mkfs.ext3 -L persistence <dev_from_step1>`

- Mount the partition and add persistence file
  - `mkdir -p /mnt/my_usb`
  - `mount <dev_from_step1> /mnt/my_usb`
  - `echo "/ union" > /mnt/my_usb/persistence.conf`
### Partition Layout

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<td>/media/Kali Live</td>
<td></td>
<td>63.03 MiB</td>
<td>59.96 MiB</td>
<td>3.07 MiB</td>
<td></td>
</tr>
<tr>
<td>/dev/sdc3</td>
<td>ext3</td>
<td>/media/Kali Live/persistence</td>
<td>persistence</td>
<td>3.68 GiB</td>
<td>130.68 MiB</td>
<td>3.55 GiB</td>
<td></td>
</tr>
<tr>
<td>unallocated</td>
<td></td>
<td></td>
<td></td>
<td>8.32 GiB</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
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0 operations pending
This is What You Probably Want

![GParted Image]

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<td>-</td>
<td>boot, hidden</td>
</tr>
<tr>
<td>/dev/sdc2</td>
<td>fat16</td>
<td>/media/jdjohn/Kali Live</td>
<td>63.03 MiB</td>
<td>59.96 MiB</td>
<td>3.07 MiB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>/dev/sdc3</td>
<td>ext3</td>
<td>/media/jdjohn/persistence</td>
<td>persistence</td>
<td>12.00 GiB</td>
<td>262.73 MiB</td>
<td>11.74 GiB</td>
<td></td>
</tr>
</tbody>
</table>
Contact Information

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