Ex6 - IO Device Files

COP4600

Unix IO Devices

- In Unix systems IO Device handling is performed using device files as intermediaries.

- Device files are interpreted as regular files by the OS, and can be interacted with using normal input/output system calls.

- In this exercise you will be creating a loopback device, which allows a regular file to pretend to be an IO Device. This is especially useful for storage images like .ISOs, since they can be interpreted as full drives of in themselves.

Ex6 - IO Device Files

- First you need to create a disk image that we can connect a loopback device to. The following command can be used to create a disk image:

  dd if=<input file> of=<output file> bs=<size in bytes> count=<block count>

- For example, if you wanted to create a disk image full of random bytes that was was 2KiB in size, with 2 blocks, it would look like:

  dd if=/dev/random of=example.img bs=1024 count=2

- Note the distinction between MB and MiB (megabytes and mebibytes).
  - One megabyte can be interpreted as being either 1,000,000 bytes, or 1,048,576 bytes (2^{20}).
  - One mebibyte is always 1,048,576 bytes .

Ex6 - IO Device Files (cont.)

- sudo losetup -f will return the first available loopback device, /dev/loop<num>

  sudo losetup /dev/block/loop<num> example.img will attach a loopback device to a disk image file at loopback device of the given index.

  mkfs.<format> example.img will reformat the image file in the given format.

- You will then need to mount the loopback device in mount directory. If the directory does not exist… create it!

- Mounting is as simple as:
  sudo mount /dev/block/loop<num> <path-to-mount-dir>

- And unmounting…
  sudo umount <path-to-mount-dir>

- Detaching…
  losetup --detach /dev/block/loop<num>

4

Searching in HexEdit

- You can search forwards or backwards in hexedit using Ctrl-S or Ctrl-R respectively.

- To search in ASCII text and not hex, press tab before pressing the search shortcut to switch contexts.

- (Go look at pdf.)

5