The Rescue Disk, Trouble Shooting and other Related Topics

1 Aim

After completing this exercise, you will:

- be aware of the usefulness of mini-Linux distributions in solving many problems, many of which are not Linux problems

- have practical experience with one of the best mini-Linux distributions, `tomsrtbt`, available from `http://www.toms.net/rb/`.

- be introduced to a shell script `report` that may be used to diagnose many computer problems, and through that:

  ○ learn some aspects of shell script programming

  ○ learn about the Linux `/proc` file system and its usefulness in describing the computer and its operation, as well as the operation of the operating system

2 Procedure

2.1 A mini-Linux distribution: `tomsrtbt`

The mini Linux distribution `tomsrtbt` is useful for recovering from many problems; it can be used to start a restore from backups after the hard disk has been completely destroyed. It is also useful as a trouble-shooting aid. This is how we will use it today.

Note that `tomsrtbt` uses the old `libc5` libraries, which are not included in Red Hat 7.0 and later. You will need to install these libraries to be able to work with `tomsrtbt`. It is convenient to install them from Red Hat 6.2.

1. NFS mount the ftp directory from CSAlinux:

   ```
   $ sudo mount CSAlinux:/var/ftp/pub /mnt
   ```

2. Change to the Red Hat 6.2 RPM directory:

   ```
   $ cd /mnt/redhat-6.2/RedHat/RPMS
   ```

3. Install the `libc5` libraries:

   ```
   $ sudo rpm -Uhv ld.so-1.9.5-13.i386.rpm libc-5.3.12-31.i386.rpm
   ```

Use the (Tab) key to complete the filenames rather than typing all the numbers in manually.

4. Change to your home directory.

5. Extract the contents of the file `tomsrtbt-1.7.218.tar.gz` with the command

   ```
   $ tar xvzf /mnt/tomsrtbt/tomsrtbt-1.7.218.tar.gz
   ```

   Again, use filename completion.

6. Unmount the network file system from CSAlinux:

   ```
   $ sudo umount /mnt
   ```

7. Install `tomsrtbt` on your floppy disk by changing into the directory ∼/`tomsrtbt-1.7.218` and typing

   ```
   $ sudo ./install.s
   ```

8. If you do not see the message "Succeeded!" after a few minutes of disk activity, your floppy disk has some defects; since it needs to be formatted with a high capacity, the floppy disk needs to be in new condition. Use a new floppy disk.

9. Boot a computer with this floppy disk.

10. Log in as root.

11. Change to the directory `/proc` and examine the content of the files `cpuinfo`, `meminfo`, `interrupts`, `pci`. Can you imagine any uses for these files?

12. List the partition information on your computer.

2.2 The shell script `report`

1. Download the shell script `report` from `http://CSAlinux.tycm.vtc.edu.hk/ossi/lab/tomsrtbt/report` (from the subject home page), and save it to your ∼/`bin` directory (create ∼/`bin` if it doesn't exist).

2. Make it executable (you should know how!), then execute it to see what it does.

3. Take a few minutes to look at the files that have been made in the directory `/tmp/reports`. What could these files be used for?

2.3 Rebuilding `tomsrtbt` to create a trouble shooting tool

1. Open the file `tomsrtbt.FAQ` so that you can easily refer to it while working in this section.

2. Unpack the contents of `tomsrtbt` onto your hard disk by executing
   `sudo ./unpack.s tomsrtbt.raw`

3. Copy the shell script `report` to the directory `tomsrtbt-1.7.218.unpacked/2/usr/bin`

4. Rebuild a new disk image containing `report` by executing `sudo 2/usr/doc/buildit.s`

5. A new package will be formed in your current directory. Change into the new directory (which has a name like *xxxx*`.tycm.vtc.edu.hk-tomsrtbt-1.7.219`), and rewrite your `tomsrtbt` disk by executing `./install.s` there.

6. Boot a computer with this disk, and execute the report program there.

7. Examine the files created there.

8. See if you can devise a way of:

   (a) putting these files into a second FAT formatted floppy disk

   (b) putting them onto the `tomsrtbt` disk itself. You will need to delete some files from your `2` directory and rebuild the disk image to achieve this.

Homework, due at the second laboratory session (within two weeks, i.e., week 24): Arrange this so that it is all automatic, so that you have a single disk that you could give to a customer with instructions to boot the computer with one floppy disk, then return the disk to you so that you have evidence that you can analyse to solve problems, without a site visit.

Here are a few ideas that you might like to consider:

- You will need to delete some commands from `tomsrtbt` to make room for the reports. You could start by deleting the two editors and the man pages. You may need a bit of trial and error to see what commands are required for this all to work.

- The file `1/rc.custom.gz` is the startup script. You will probably need to start `report` from this script; you will do most (all?) of the customisation here.

- You could write the reports to the RAM disk in `/tmp`

- You could compress the reports so that they take less space using `tar` and `bzip2`

- You will need to mount the floppy with a command like

  `# mount /dev/fd0u1722 /fl`

- Your script should shutdown the computer when it is finished.

A   Appendix: the shell script `report` and shell programming

A.1 The shell script itself

The shell script `report` is shown here: