Chapter 23: Managing Shared Libraries

Introduction to shared libraries

- Shared libraries are software used between different programs
- Library files end in .so
- Advantages:
  - Each program files can be smaller
  - The programs can use a more consistent base of code
  - Programs can be developed faster

Library linker programs

- Two system commands provide shared libraries to commands:
  - The dynamic linker (`/lib/ld-linux.so`)
  - Legacy linker: `/lib/ld.so`
- Will search for the libraries in:
  - The /lib directory & the /usr/lib directory
  - The directories listed in LD_LIBRARY_PATH
  - The cache file: /etc/ld.so.cache

Library configuration

- Most software places libraries in the /lib directory or the /usr/lib directory
- Additional directories can be added by the `ldconfig` command
- The `ldconfig` command reads from the /etc/ld.so.conf configuration file
- The primary configuration file also looks in:
  - include **ld.so.conf.d/*.conf**

Library Configuration

- Most custom software places libraries in custom locations
- For example, the mysql-libs package stores library files in the /usr/lib/mysql
- To configure this, the package creates the /etc/ld.so.conf.d/mysql-i386.conf file with the following entry:

  /usr/lib/mysql

The LD_LIBRARY_PATH variable

- Users may want custom library directories
- Use the LD_LIBRARY_PATH variable to specify a custom library for a user:

  #export LD_LIBRARY_PATH=/home/jose/app/lib
- To make this a permanent change, place the command in their shell configuration file

The ldd command

- To display what libraries a binary command uses, execute the `ldd` command
- Output looks like the following:

```
$ldd /bin/bash
linux-gate.so.1 =>  (0x0065d000)
libtinfo.so.5 => /lib/libtinfo.so.5 (0x03e78000)
libdl.so.2 => /lib/libdl.so.2 (0x00740000)
libc.so.6 => /lib/libc.so.6 (0x00161000)
/lib/ld-linux.so.2 (0x00578000)
```