

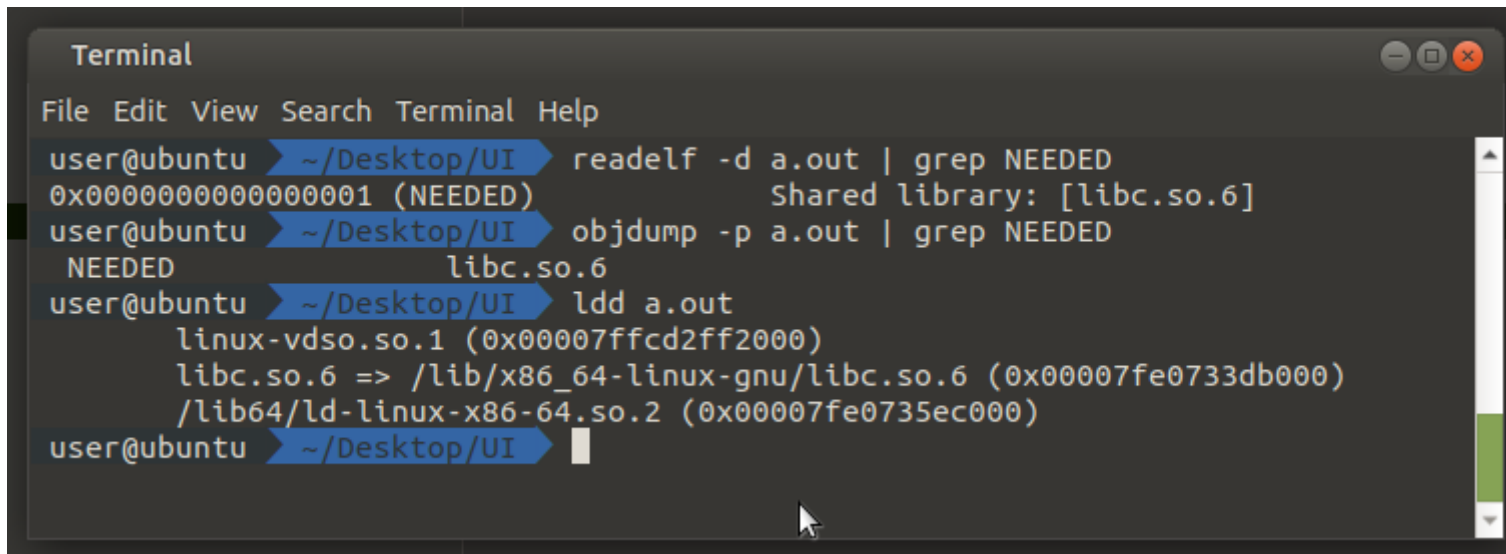
Lab 1 ELF

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Useful utilities - readelf, objdump, ldd

- > There are subset of helpful utilities to work with elf file format:
- > **readelf** - display information about ELF files,
- > **objdump** - display information from object files,
- > **ldd** - print shared object dependencies.

A terminal window titled "Terminal" with a menu bar (File, Edit, View, Search, Terminal, Help) and standard window controls. The terminal shows a series of commands and their outputs. The first command is 'readelf -d a.out | grep NEEDED', which outputs '0x0000000000000001 (NEEDED) Shared library: [libc.so.6]'. The second command is 'objdump -p a.out | grep NEEDED', which outputs 'NEEDED libc.so.6'. The third command is 'ldd a.out', which outputs 'linux-vdso.so.1 (0x00007ffcd2ff2000)', 'libc.so.6 => /lib/x86_64-linux-gnu/libc.so.6 (0x00007fe0733db000)', and '/lib64/ld-linux-x86-64.so.2 (0x00007fe0735ec000)'. The fourth command is a prompt 'user@ubuntu ~/Desktop/UI' with a cursor. The terminal has a scrollbar on the right side.

```
Terminal
File Edit View Search Terminal Help
user@ubuntu ~/Desktop/UI readelf -d a.out | grep NEEDED
0x0000000000000001 (NEEDED) Shared library: [libc.so.6]
user@ubuntu ~/Desktop/UI objdump -p a.out | grep NEEDED
NEEDED libc.so.6
user@ubuntu ~/Desktop/UI ldd a.out
linux-vdso.so.1 (0x00007ffcd2ff2000)
libc.so.6 => /lib/x86_64-linux-gnu/libc.so.6 (0x00007fe0733db000)
/lib64/ld-linux-x86-64.so.2 (0x00007fe0735ec000)
user@ubuntu ~/Desktop/UI
```

TASK

- › Learn how LDD utility works.
- › Implement the app called `bldd` (backward ldd) – that shows all EXECUTABLE files that use specified shared library files. *See example.*
- › App must be configurable (for ex. Possibility to set up scan directory)
- › App must generate report as the output (txt, pdf, etc.) – can be implemented using any languages and libraries.
- › Report must be sorted by number of executable usages (high -> low). *See example.*
- › App **must** work with at least following arches: x86, X86-64, arm, aarch64. (must be architecture dependent)
- › App must have `help` with usage examples.
- › Graded output: source code with report including screenshots. (in PDF)

Acceptance criteria

- › **A (20 points)** – app meets all listed criteria.
- › **B (15-19 points)** – minor issues (for ex. No help for app, no directory configuration).
- › **C (10-14 points)** – major issues (for ex. App can work only with one arch or do not care about arches).

Lab 1

Output example

Report on dynamic used libraries by ELF executables on /home

----- i386 (x86) -----

libc.so.0.1 (1 execs)

-> /home/inno/QEMU/buildroot-2022.02.1/output/build/host-patchelf-0.9/tests/no-rpath-prebuild/no-rpath-kfreebsd-i386

libc.so.0.3 (1 execs)

-> /home/inno/QEMU/buildroot-2022.02.1/output/build/host-patchelf-0.9/tests/no-rpath-prebuild/no-rpath-hurd-i386

libc.so.6 (1 execs)

-> /home/inno/QEMU/buildroot-2022.02.1/output/build/host-patchelf-0.9/tests/no-rpath-prebuild/no-rpath-i386

----- x86-64 -----

libc.so.6 (681 execs)

-> /home/inno/QEMU/buildroot-2022.02.1/output/build/host-gmp-6.2.1/gen-psqr

-> /home/inno/QEMU/buildroot-2022.02.1/output/build/host-gmp-6.2.1/gen-fib

-> /home/inno/QEMU/buildroot-2022.02.1/output/build/host-gmp-6.2.1/gen-trialdivtab

-> /home/inno/QEMU/buildroot-2022.02.1/output/build/host-gmp-6.2.1/gen-fac

-> /home/inno/QEMU/buildroot-2022.02.1/output/build/host-gmp-6.2.1/gen-bases

-> /home/inno/QEMU/buildroot-2022.02.1/output/build/host-gmp-6.2.1/gen-jacobitab



Thanks for your attention!

About US

Open Mobile Platform, LLC

Shortly:

- > Founded in 2016
- > Offices in Moscow, Innopolis and St.Petersburg
- > 200+ qualified IT specialists

Main products:

- > OS Aurora + Aurora SDK
- > Cloud Platform
Aurora Center (Enterprise Mobility Management)
- > Aurora TEE

