L03 Development Tools

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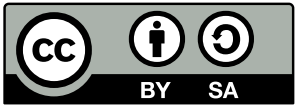

Scripts

1. Scripts
2. Build Tools
3. Development Tools
4. Meeting
   - Recapitulation

Learning Outcomes

After successful completion of L03
students will be able to

- remember how development tools help
- make modifications in scripts

Scripts

FLOSS encourages to:

- combine
- modify
- share

Finding

Can be easily done using scripts.

Portable Shell Scripts

- defined by POSIX
- supported by most shells like bash, zsh, ...
- use `#!/bin/sh` as shebang

development tools:

- checkbashisms (in devscripts, check_bashisms)
- shfmt (check_posix)
- shellcheck

Reformatting (1)

Serial variant of scripts/dev/reformat-all

```
1  #!/bin/sh
2  #
3  # @author Klemens
4  # @brief Calls all other reformat scripts
5  # @date 29.03.2019
6  # @tags reformat
7
8  DEV_SCRIPTS_DIR=$(dirname "$0")
9  . "${DEV_SCRIPTS_DIR}/include-common"
10
11 cd "$SOURCE" || exit
12
```

Reformatting (2)

```
13 reformat() {
14     reformat=$1
15     shift
16     echo "starting $reformat ..."
17     "$reformat" "$@"
18     echo "finished $reformat"
19 }
20
21 IFS='
22 '
23 for reformat in "$DEV_SCRIPTS_DIR"/reformat-*; do
24     [ "$(basename "$reformat")" = "reformat-all" ] && continue
25     reformat "$reformat" "$@"
26 done
```

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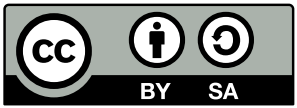

Build Tools

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Goals

Build tools:

- (cross-)compile the software
- generate documentation and other files
- run scripts, shared with build server
- run tests (e.g., ctest)
- create packages (e.g., cpack)

Generation

How build tools typically:

- e.g. automake generates `./configure` shell scripts, which generates Makefiles
- e.g. CMake generates Makefiles, Ninja or project files of various IDEs
- other build tools directly invoke the compiler

Task

Which build tool do you know? How does it work?

Example: Elektra Plugins

README.md of plugins is used:

during configure time: include/exclude plugins based on `infos/status`
during build time: README.md gets included in the plugin's code
at run time: mounting plugins using `infos/provides`

Implementation see `scripts/cmake/Modules/LibAddPlugin.cmake`

CMake: Different Configurations

Common variants of how to run cmake are in `scripts/dev/configure-*`

```
1 cmake␣\
2 -DPLUGINS="ALL;-EXPERIMENTAL"␣\
3 -DTOOLS="ALL"␣\
4 -DENABLE_DEBUG="ON"␣\
5 -DENABLE_LOGGER="ON"␣\
6 .
```

Environment

1. use Docker
2. `. scripts/dev/run_env` which basically does:

```
1  # common configure script
2  export SCRIPTS_DIR="${ELEKTRA_DIR}/scripts/dev"
3  . "${SCRIPTS_DIR}/include-common"
4
5  export PATH="$BUILD/bin:$SCRIPTS_DIR:$PATH"
6  export KDB_EXEC_PATH="$COMMON_PATH:$KDB_EXEC_PATH"
7  export LD_LIBRARY_PATH="$BUILD/lib:$LD_LIBRARY_PATH"
8  export MANPATH="$SOURCE/doc/man:$MANPATH"
9  export CLASSPATH="$CLASSPATH:$BUILD/lib/libelektra.jar"
10
11 export PS1="[DEV] $PS1"
```

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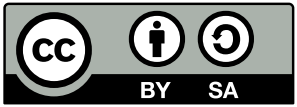

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Use Tools or Libraries?

Example: Internationalization (i18n) and Localization (L10n)

- self-made key/value lookup
- GNU gettext model, plural, context

Finding

Quickly pays off to learn FLOSS tools.

Licensing Check Tools

If you copy FLOSS to Elektra's source, make sure:

- it is BSD-licensed (or less restricted)
- license information is added in `.reuse/dep5`

`https://reuse.software/`

Elektra's Test Tools

See `doc/TESTING.md`:

- valgrind
- ASAN
- AFL++
- Shell Recorder

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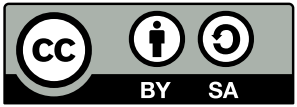

Meeting

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