Essential Skills (4)

Tykushin Anatoly, a.tykushin@innopolis.ru, MSIT-SNE

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1 GNU Automake

- helps to create portable Makefiles for use with the make utility (input *Makefile.am*; output *Makefile.in*
- *Makefile.in* is then used by the configure script to generate a *Makefile* [2]

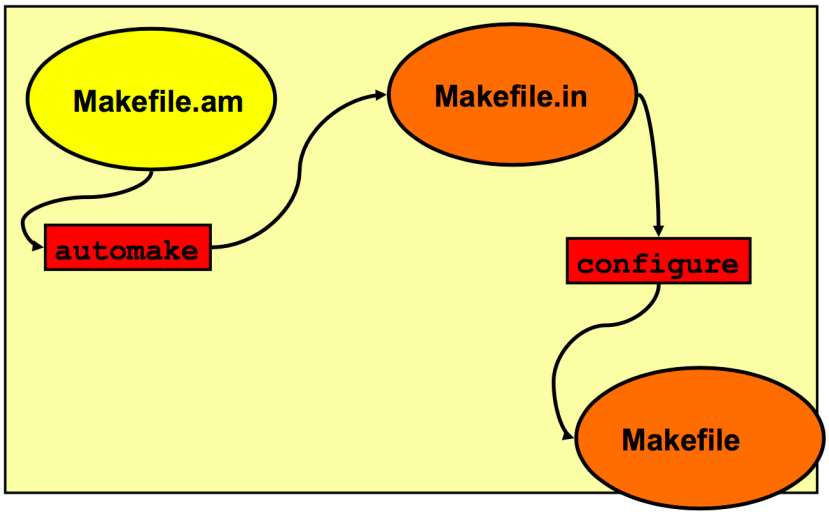

Figure 1: GNU Automake procedure

Usage example (as shown on the figure **??** Our package builds a program sne, simply add the following to the *Makefile.am* in the directory where the program is Built.

Example File *foo.c*

```
#include <stdio.h>
main()
{
        printf("Cum grano salis \n");
}
```

File: *Makefile.am*

```
bin_PROGRAMS = foo
foo_SOURCES = foo.c
```

File: *configure.ac*

```
AC_INIT(foo.c)
AM_INIT_AUTOMAKE(latin_words, 0.9)
AC_PROG_CC
AC_HEADER_STDC
AC_PROG_INSTALL
AC_OUTPUT([Makefile])
```

Where

AC-INIT(sourcefile) Initializes autoconf, should be the first macro [1]

AM-INIT-AUTOMAKE(latin-words, 0.9) Runs many macros required for proper operation of the generated Makefiles

AC-PROG-CC Determines a C compiler to use, sets the CC variable, initializes the CFLAGS

AC-HEADER-STDC Checks for *stdlib.h, stdarg.h, string.h* and *float.h*, defines STDC-HEADERS on success

AC-PROG-INSTALL Set variable INSTALL to the path of a BSD-compatible install program

AC-OUTPUT([Makefile)] Create output files in the case the Makefile.

1.1 Autoheader

- Create a template header for configure
- Usage ? run autoheader on a directory with a *configure.ac* that contains a AC-CONFIG-HEADER macro call, and it will write the *configure.in* file

1.2 GNU Libtool

- helps manage the creation of static and dynamic libraries on various Unix-like operating systems
- hides the complexity of using shared libraries on different [3]

Platforms - provide a generic interface for developers

clean Remove files from the build directory

compile Compile a source file into a libtool object.

execute AutomaMcally set the library path, then run a program.

finish Complete the installaMon of libtool libraries.

install Install libraries or executables.

link Create a library or an executable.

uninstall Remove libraries from an installed directory.

1.3 Steps involved in creating a software

1. create source
2. create configure.ac
3. create makefile.am
4. aclocal
5. autoconf
6. automake -a //to add missing files

References

[1] Autoconf. *GNU Operating system site, "http://www.gnu.org/software/autoconf/autoconf.html",*, -1, 2016.

[2] Automake. *GNU Operating System site, "http://www.gnu.org/software/automake/automake.html",*, -1, 2016.

[3] Libtool. *GNU Operating System site, "http://www.gnu.org/software/libtool/libtool.html",*, -1, 2016.