Memasang Library PortAudio dengan Low Level PulseAudio pada Ubuntu 16.04 LTS

Note : Metode pemasangan berlaku umum sehingga dapat diterapkan pada OS Ubuntu berbagai arsitektur termasuk Ubuntu Arm dan Ubuntu Aarch64

1. Pasang paket dependency PortAudio dan PulseAudio:

```
$ sudo apt-get install git libpulse-dev automake libtool
```

2. Unduh source code PortAudio dengan Low Level PulseAudio:

```
$ git clone https://github.com/zero15120/portaudio-pulse
$ cd portaudio-pulse
```


3. Ubah permission eksekusi file configure melalui perintah berikut:

```
$ sudo chmod a+x configure
```


4. Siapkan source code untuk proses build melalui perintah berikut:

```
$ aclocal
$ libtoolize -f
$ autoconf -f
$ automake -f
```

```
isro@isro-vmware:~/portaudio-pulse$ aclocal
aclocal: warning: autoconf input should be named 'configure.ac', not 'configure.in'
isro@isro-vmware:~/portaudio-pulse$ libtoolize -f
libtoolize: putting auxiliary files in '.'.
libtoolize: linking file './ltmain.sh'
libtoolize: Consider adding 'AC_CONFIG_MACRO_DIRS([m4])' to configure.in,
libtoolize: and rerunning libtoolize and aclocal.
libtoolize: Consider adding '-I m4' to ACLOCAL_AMFLAGS in Makefile.am.
isro@isro-vmware:~/portaudio-pulse$ autoconf -f
isro@isro-vmware:~/portaudio-pulse$ automake -f
automake: warning: autoconf input should be named 'configure.ac', not 'configure.in'
configure.in: error: no proper invocation of AM_INIT_AUTOMAKE was found.
configure.in: You should verify that configure.in invokes AM_INIT_AUTOMAKE,
configure.in: that aclocal.m4 is present in the top-level directory,
configure.in: and that aclocal.m4 was recently regenerated (using aclocal)
automake: error: no 'Makefile.am' found for any configure output
```

```
isro@isro-vmware:~/portaudio-pulse$ ls
aclocal.m4              Doxyfile                portaudio-2.0.pc.in
autom4te.cache          Doxyfile.developer      qa
bindings                examples                README.configure.txt
build                   fixdir.bat              README.md
clear_gitrevision.sh    fixfile.bat             README.txt
CMakeLists.txt          include                 SConstruct
cmake_support           index.html              src
config.guess            install-sh              test
config.sub              LICENSE.txt             testcvs
configure               ltmain.sh               update_gitrevision.sh
configure.in            Makefile.in
doc                     pablio
```

5. Konfigurasi source code untuk proses build melalui perintah berikut:

```
$ ./configure --with-pulseaudio --without-alsa --without-oss --without-jack
```

```
Configuration summary:

    Target ..................... x86_64-unknown-linux-gnu
    C++ bindings ............... no
    Debug output ............... no

    ALSA ....................... no
    ASIHPI ..................... no

    OSS ........................ no
    JACK ....................... no
    PulseAudio ................. yes
```

```
isro@isro-vmware:~/portaudio-pulse$ ls
aclocal.m4              doc                     Makefile.in
autom4te.cache          Doxyfile                pablio
bindings                Doxyfile.developer      portaudio-2.0.pc
build                   examples                portaudio-2.0.pc.in
clear_gitrevision.sh    fixdir.bat              qa
CMakeLists.txt          fixfile.bat             README.configure.txt
cmake_support           include                 README.md
config.guess            index.html              README.txt
config.log              install-sh              SConstruct
config.status           libtool                 src
config.sub              LICENSE.txt             test
configure               ltmain.sh               testcvs
configure.in            Makefile                update_gitrevision.sh
```

6. Build source code melalui perintah berikut:

```
$ make
```

```
isro@isro-vmware:~/portaudio-pulse$ ls
aclocal.m4              doc                   Makefile.in
autom4te.cache          Doxyfile              pablio
bin                     Doxyfile.developer    portaudio-2.0.pc
bindings                examples              portaudio-2.0.pc.in
bin-stamp               fixdir.bat            qa
build                   fixfile.bat           README.configure.txt
clear_gitrevision.sh    include               README.md
CMakeLists.txt          index.html            README.txt
cmake_support           install-sh            SConstruct
config.guess            lib                   src
config.log              lib-stamp             test
config.status           libtool               testcvs
config.sub              LICENSE.txt           update_gitrevision.sh
configure               ltmain.sh
configure.in            Makefile
```

7. Pasang hasil build source code melalui perintah berikut:

```
$ sudo make install
```



```
---------------------------------------------------------
PortAudio was successfully installed.

On some systems (e.g. Linux) you should run 'ldconfig' now
to make the shared object available.  You may also need to
modify your LD_LIBRARY_PATH environment variable to include
the directory /usr/local/lib
---------------------------------------------------------

make install-recursive
make[1]: Entering directory '/home/isro/portaudio-pulse'
if test -n "" ; then for dir in ""; do make -C $dir install; done ; fi
make[1]: Leaving directory '/home/isro/portaudio-pulse'
```