NETWORKING & SYSTEM ADMINISTRATION LAB

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Experiment No.: 27

Aim

Build and install software from source code, familiarity with make and cmake utilities expected.

Procedure

1. We can obtain information of a package and its dependencies using the apt command. Doing that for cmake:

   $ apt show cmake

2. To install cmake , g++ and make using the apt command, type:

   $ sudo apt install cmake g++ make

```
mca@S14:~/Documents/CMake$ sudo apt install cmake g++ make
Reading package lists... Done
Building dependency tree
Reading state information... Done
g++ is already the newest version (4:7.3.0-3ubuntu2).
make is already the newest version (4.1-9.1ubuntu1).
make set to manually installed.
The following packages were automatically installed and are no longer required:
  debhelper dh-autoreconf dh-strip-nondeterminism libarchive-cpio-perl libfile-stripnondeterminism-perl libglew2.0 libmail-sendmail-per
  libopenal-data libopenal1 libpcre16-3 libpcre3-dev libpcre32-3 libpcrecpp0v5 libsdl2-2.0-0 libsdl2-image-2.0-0 libssl-dev libssl-doc
  libsys-hostname-long-perl php-common php-pear php-xml php7.2-cli php7.2-common php7.2-json php7.2-opcache php7.2-readline php7.2-xml
  pkg-php-tools po-debconf shtool supertux-data
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  cmake-data libcurl4 libjsoncpp1 librhash0 libuv1
Suggested packages:
  cmake-doc ninja-build
The following NEW packages will be installed:
  cmake cmake-data libcurl4 libjsoncpp1 librhash0 libuv1
0 upgraded, 6 newly installed, 0 to remove and 9 not upgraded.
Need to get 4,900 kB of archives.
After this operation, 25.3 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://in.archive.ubuntu.com/ubuntu bionic/main amd64 cmake-data all 3.10.2-1ubuntu2 [1,331 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu bionic/main amd64 libcurl4 amd64 7.58.0-2ubuntu3 [214 kB]
Get:3 http://in.archive.ubuntu.com/ubuntu bionic/main amd64 libjsoncpp1 amd64 1.7.4-3 [73.6 kB]
Get:4 http://in.archive.ubuntu.com/ubuntu bionic/main amd64 librhash0 amd64 1.3.6-2 [78.1 kB]
Get:5 http://in.archive.ubuntu.com/ubuntu bionic/main amd64 libuv1 amd64 1.18.0-3 [64.4 kB]
Get:6 http://in.archive.ubuntu.com/ubuntu bionic/main amd64 cmake amd64 3.10.2-1ubuntu2 [3,138 kB]
Fetched 4,900 kB in 1s (6,162 kB/s)
Selecting previously unselected package cmake-data.
(Reading database ... 185275 files and directories currently installed.)
Preparing to unpack .../0-cmake-data_3.10.2-1ubuntu2_all.deb ...
Unpacking cmake-data (3.10.2-1ubuntu2) ...
Selecting previously unselected package libcurl4:amd64.
Preparing to unpack .../1-libcurl4_7.58.0-2ubuntu3_amd64.deb
```

A Sample CMake project

```
mca@T70:~/Documents/Cmake$ mkdir projectzero
mca@T70:~/Documents/Cmake$ cd projectzero
mca@T70:~/Documents/Cmake/projectzero$ gedit hello_world.cpp
mca@T70:~/Documents/Cmake/projectzero$ gedit CMakeLists.txt
```

CMakeLists.txt

```cpp
#include <iostream>
        int main() {
        std::cout<<"Hello World!"<<std::endl;
        return 0 ;
        }
```

```cmake
cmake_minimum_required(VERSION 3.10)
project(MyProject)
add_executable(hello Hello_world.cpp)
```

A directory to which CMake was executed is called "Built Directory

```
mca@T70:~/Documents/Cmake/projectzero$ mkdir build
mca@T70:~/Documents/Cmake/projectzero$ cd build
mca@T70:~/Documents/Cmake/projectzero/build$ cmake ..
-- The C compiler identification is GNU 7.3.0
-- The CXX compiler identification is GNU 7.3.0
-- Check for working C compiler: /usr/bin/cc
-- Check for working C compiler: /usr/bin/cc -- works
-- Detecting C compiler ABI info
-- Detecting C compiler ABI info - done
-- Detecting C compile features
-- Detecting C compile features - done
-- Check for working CXX compiler: /usr/bin/c++
-- Check for working CXX compiler: /usr/bin/c++ -- works
-- Detecting CXX compiler ABI info
-- Detecting CXX compiler ABI info - done
-- Detecting CXX compile features
-- Detecting CXX compile features - done
-- Configuring done
-- Generating done
-- Build files have been written to: /home/mca/Documents/Cmake/projectzero/build
mca@T70:~/Documents/Cmake/projectzero/build$ cmake --build .
Scanning dependencies of target hello
[ 50%] Building CXX object CMakeFiles/hello.dir/hello_world.cpp.o
[100%] Linking CXX executable hello
[100%] Built target hello
mca@T70:~/Documents/Cmake/projectzero/build$  ./hello
Hello World!
mca@T70:~/Documents/Cmake/projectzero/build$
```

"