

CMake and friends

...more than just a buildsystem

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CMake and friends (<http://www.cmake.org>)

- **CMake**: configuring and building
- **CTest & Dart**: testing and continuous integration
- **CPack**: packaging
- BSD license, developed by Kitware (<http://www.kitware.com>)
- Portable: Linux, Mac OS X, *BSD, MS Windows, Solaris, QNX, BeOS, AIX, HP-UX, IRIX
- only requirement: C++ compiler

CMake

- Cross platform buildsystem
- Creates Makefiles (e.g. GNU, Borland, MS, ...) and project files for KDevelop3, XCode, MS Visual Studio ≥ 6
- supports C, C++, Fortran, Java
- simple scripting language
- replaces autoconf, autoheader, automake, libtool, sh, m4
- Used e.g. by KDE 4, OpenWengo, ITK, VTK, Chicken Scheme, Boson, Scribus, libgphoto, PIPlot, Debian cdrecord, Rosegarden and others

CMake: *Building Software*

- supports executables, static and shared libraries
- cares for platform specific issues
- in- and out-of-source
- complete dependencies
- advanced RPATH handling
- install rules

```
set(fooSrcs process.c foo.c)
add_library(foo SHARED ${fooSrcs})

add_executable(hello main.cpp)
target_link_libraries(hello foo)

install(TARGETS foo DESTINATION lib )
```

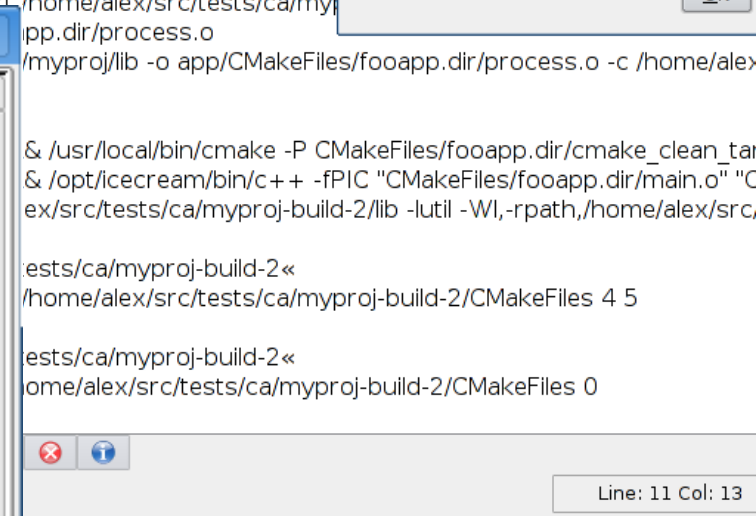
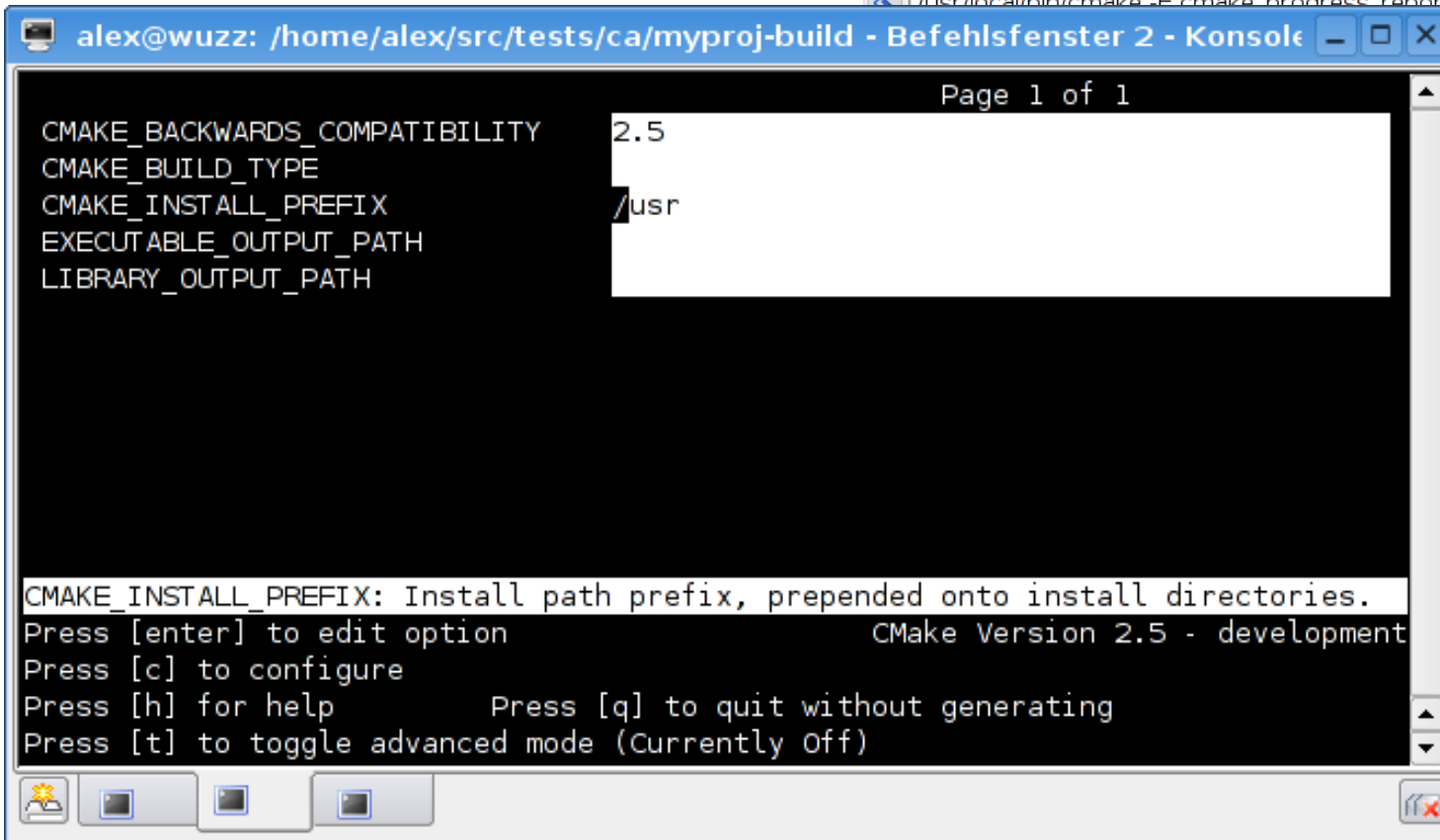
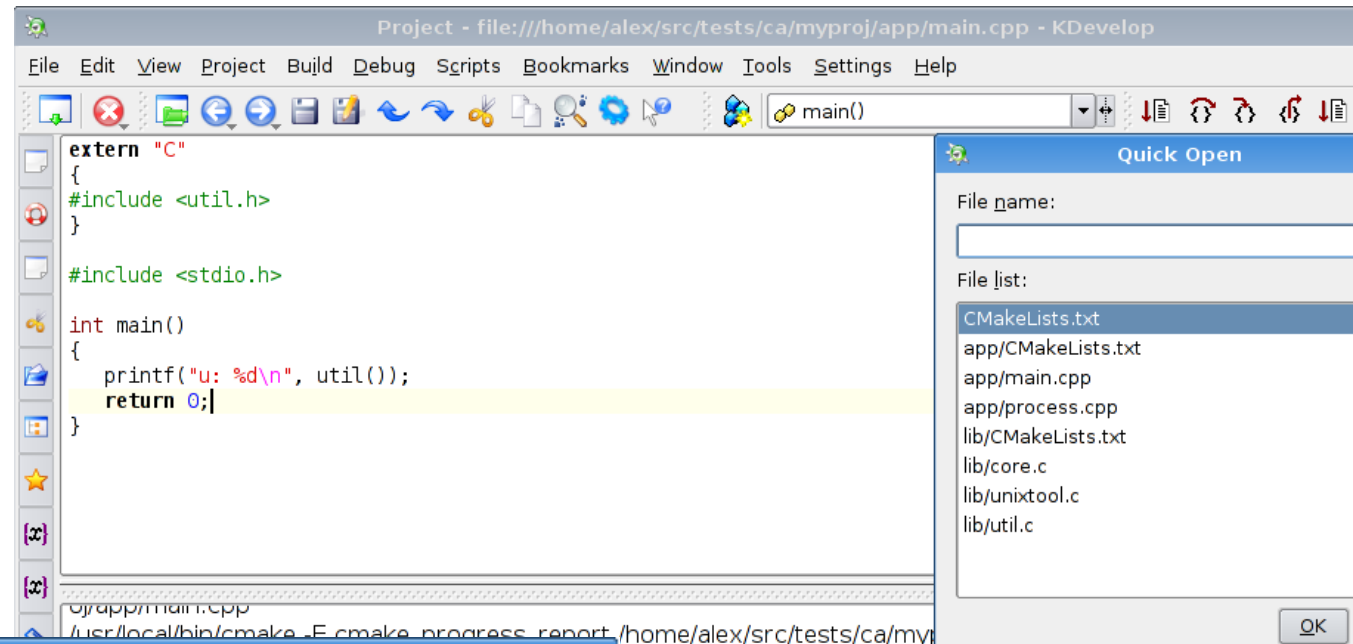
CMake: *Configuring software*

- handling of system specific properties before building
- condition statements
- `find_package(<name>)`
- check for headers, functions etc.
- creating config-headers
- execution of programs, regexps, etc.

```
if(WIN32)
    add_definitions(-D_USE_WIN32_HELPERS)
endif(WIN32)
find_package(PNG REQUIRED)
include_directories(${PNG_INCLUDE_DIR})
check_include_files(malloc.h HAVE_MALLOC_H)
configure_file(config.h.in ${CMAKE_BINARY_DIR}/config.h)
```

CMake: Usage

```
$ mkdir build
$ cd build
$ cmake .. -GKDevelop3
$ kdevelop foo.project &
```



CTest & Dart

If it's not tested, it doesn't work !

- Unit testing
- Continuous and Nightly Builds: central Dart server, decentralized builds on all platforms

```
enable_testing()  
add_executable(foo)  
add_test(foo test foo)  
  
$ make Experimental
```

CTest & Dart

Build Log line 11

File: [Source/kwsys/RegularExpression.cxx](#) Line: [633](#)[CVS](#)

```
[ 1%] Building C object Source/kwsys/CMakeFiles/cmsys.dir/System.o
[ 1%] Building CXX object Source/kwsys/CMakeFiles/cmsys.dir/Directory.o
[ 2%] Building CXX object Source/kwsys/CMakeFiles/cmsys.dir/DynamicLoader.o
[ 2%] Building CXX object Source/kwsys/CMakeFiles/cmsys.dir/Glob.o
[ 2%] Building CXX object Source/kwsys/CMakeFiles/cmsys.dir/RegularExpression.o
/.../CMake/Source/kwsys/RegularExpression.cxx: In function 'char* cmsys::regatom(int*)':
/.../CMake/Source/kwsys/RegularExpression.cxx:633: warning: use of old-style cast
```



Dashboard - Sat Feb 10 11:
Saturday, February 10 2007

[Dashboard](#) [Date](#) [T](#) [Updates](#)

[4 Files Changed](#) by 2 Authors as of 2007-02-10 01:00 GMT

Nightly Builds

Site	Build Name	Update	Cfg	Build			Test				
				Error	Warn	Min	NotRun	Fail	Pass	NA	Min
r36n11.pbm.ihost.com	AIX53-xIC	4	0	0	0	4.3	0	0	71	15	25.8
icculusDotOrgBeOS	beos5pemax-gcc2.- 9-991026	1	0	0	0	10.4	0	2	67	17	20.5
SINTEF.Health.- MedTech-MacPro.- Xeon.OSX	CMakeCvs_CMake246_- gcc401	4	0	0	0	1.7	0	0	69	17	9.4

Files changed r36n11.pbm.ihost.com -- AIX53-xIC as of Feb 10 2007

[\[Expand all\]](#) | [\[Collapse all\]](#)

Updated files (4)

Source (4)

[cmCommandArgumentParserHelper.cxx](#) Rev: 1.18 by [hoffman](#)

ENH: add atonly support to cmCommandArgumentParserHelper.cxx

[cmCommandArgumentParserHelper.h](#) Rev: 1.10 by [hoffman](#)

ENH: add atonly support to cmCommandArgumentParserHelper.cxx



CPack

- Creating source and binary packages:
 - tar.gz/bz2/Z packages
 - cygwin packages
 - MS Windows: Nullsoft installer files
 - Mac OS X: Package Maker packages

```
project(Scribus)  
add_executable(scribus main.cpp)  
install(TARGETS scribus DESTINATION bin)  
include(CPack)  
  
$ make package
```

The Future

- built-in support for cross-compiling
- creating library frameworks on OS X
- more project generators, e.g. Eclipse, CodeBlocks, Anjuta
- more package generators: RPM, Debian
- improved GUI instead of cmake
- more languages: OCaml, Assembler ... ?

End

- **<http://www.cmake.org>**
- Man-Page
- Wiki
- FAQ
- Mailinglist
- Book: "Mastering CMake"