

Software construction tools for KDE

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Outline

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- 2 Software for building KDE applications
 - Overview of the KDE build system
 - Main families
 - KDE4 expected changes
- 3 The Bksys framework
 - A full-featured replacement for building KDE applications
 - Organization of the framework
 - Further improvements
- 4 Conclusion
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Introduction

- About the author
 - Software Engineer, School of the Mines of Nantes, graduated in 2004
 - Main area of interest:
 - KDissert, a mind-mapping tool for document creation
 - BKsys, a replacement for the KDE build system
- Acknowledgements
 - The Kdissert users
 - The BKsys early adopters (Rosegarden, kio-locate, ..)
 - The Akademy team

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Introduction KDE application writing

• Tools required

- make -f Makefile.cvs; configure; make; make install
- Autoconf, Aclocal, Autoheader, Automake, Libtool, GNU/Make

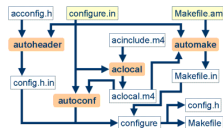


Figure: Organization of the tools

- Installation: copy files at specific locations and change permissions

Rules are joined in cascade

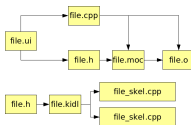


Figure: Source code compilation

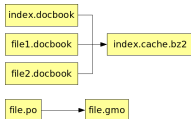


Figure: Documentation compilation

Shortcomings of the current build system

- Technical features
 - Size of the scripts, tools needed for the compilation and overall speed
 - Addition of new compilation rules is uneasy
- User-friendliness
 - Reliability of the builds
 - Hard to make mistakes, easy to spot them

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Main families

- Make based: GNU/Make, NMake - unreliable, complicated and unportable
 - reliability and usability
 - portability and maintainability
- Makefile generators: QMake, Autotools, CMake - use macros as a language
 - still questionable reliability
 - more commands are required for compiling
 - errors are harder to debug
- Script-based: Unsermake, SCons, Cons - slow and memory-consuming
 - Powerful languages (python, perl) are used
 - No separation between data and logic
 - Less adapted for incremental builds (but better at distributed ones)

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KDE4 expected changes

- Changes are difficult to enforce
 - The codebase prevents a quick transition
 - The developers are not willing to change their tools
- State of the main candidates
 - Unsermake is meant to provide a smooth transition to developers hence the preferred solution for KDE4
 - QMake does not have the necessary features but CMake was proved to work and scale
 - BKsys provides a complete replacement for the KDE3 build system

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A full-featured replacement for building KDE applications

- Target audience
 - New projects
 - Casual programmers
- SCons-based
 - Scons can be included: 57kb
 - The admin/ directory weights only about 150kb
- Build KDE and other kinds of programs: Wxwidgets, Qt4, ..
- Main features: small, fast, reliable, and separation of the build dir

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Organization of the framework

- Tell the tool what to build
 - Build things from sources
 - Install files in locations
 - Give explicit dependencies
- Give rules for building
 - Tells the tool how to produce the files
 - Scan files for implicit dependencies
- Detect the system configuration
 - Find headers, libraries and configuration checks
 - Make components reusable among projects

Project setup

- Declaring targets
 - The scripting interface
 - Really complicated builds are possible
 - Brute-force parsing is made difficult
 - Pmanager, the GUI for BKsys
 - Easy to parse and to create check tools
 - Gui is provided for user-friendliness, Kdevelop integration is easy
- Adding new rules and configurations
 - Modules are python files
 - Add configuration checks

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Further improvements

- Overcome the autotools incompatibilities to facilitate the migration
 - The command-line handling is slightly different
 - Wrappers are provided
- More detection modules are needed
 - Creation of a library of modules
 - More configuration helpers
- Finish the GUI
 - Add and remove targets and sources
 - Use of drag and drop

Conclusion

- BKsys targets a particular kind of application development
- It needs a stronger userbase to evolve faster

Questions ?

References

- Build systems reviews
 - Article on build systems:
<http://freshmeat.net/articles/view/1715/>
 - Another review:
http://www.a-a-p.org/tools_build.html
- Software construction tools
 - CMake page <http://www.cmake.org/>
 - SCons, the foundation of BKsys
<http://www.scons.org/>
 - BKsys page
<http://freehackers.org/~tnagy/bkys.html>

References (2)

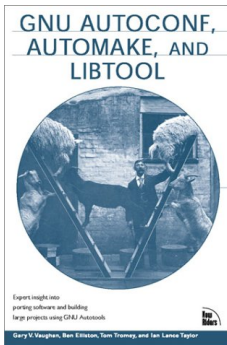


Figure: A book on Autotools