



boost && CMake

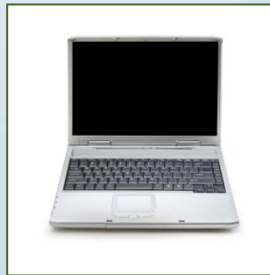
boostcon, May 2010

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How CMake Changes The Way We Build C++

- Boost aims to give C++ a set of useful libraries like Java, Python, and C#
- CMake aims to give C++ compile portability like the compile once and run everywhere of Java, Python, and C#
 - Same build tool and files for all platforms
 - Easy to mix both large and small libraries

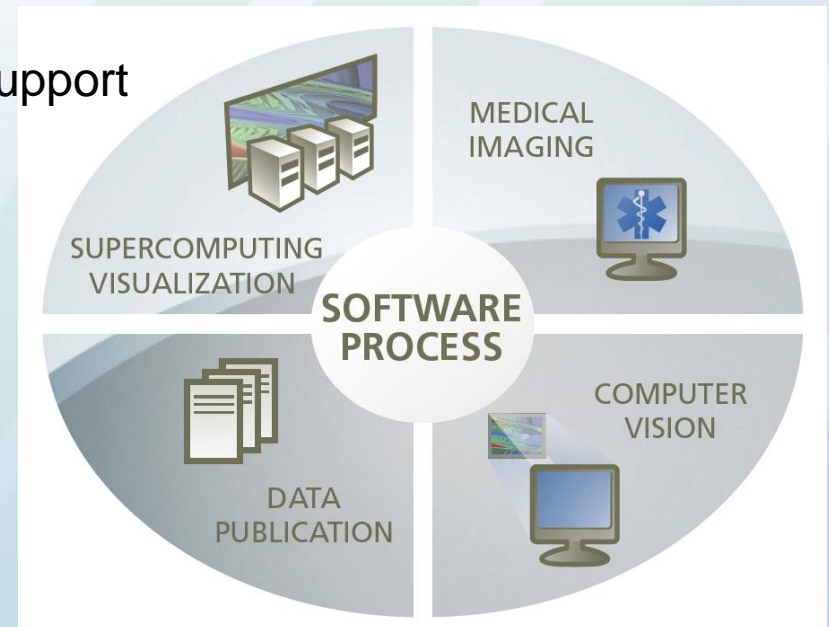


Kitware Pledge to Support boost

- one man-month over the next year
 - (this is a guaranteed minimum level of effort)
 - additional effort is very likely, if needed
- sponsored by Kitware clients with
 - direct interest in building boost with CMake
 - significant overlap with proposed new functionality

Kitware: the Company

- Founded in 1998
- Founders: 5 previous employees of GE Corporate Research
- Privately held, profitable from creation, no debt
 - Revenues ~\$9 million in 2009
 - Principally consulting/grants, with support product revenue
- Approximately 65 employees growing rapidly (30% in 2009)
 - > 25 PhD



Who Is Involved?

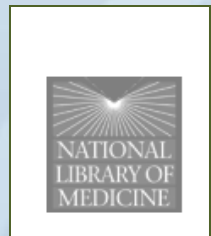
Users

- KDE
- Second Life
- ITK
- VTK
- ParaView
- Trilinos
- Scribus
- Boost (Experimentally)
- MySQL
- LLVM
- many more



Supporters

- Kitware
- ARL
- National Library of Medicine
- Sandia National Labs
- Los Alamos National Labs
- NAMIC



Using CMake: Benefits

- CDash, CMake and CTest have lots of direct funding coming from multiple Kitware clients
- Indirect funding is also available when boost community needs overlap with Kitware client needs
- Using CMake means
 - joining a community that is well funded and very interested in C++ software development

Specific Objectives

- Build boost with CMake (officially)
 - get rid of that “(Experimentally)” on prior slide...
- Enable incremental testing based on dependency analysis: at build time and at test time
- Cloud based testing with CDash & git

Architecture / Refactoring

- Presently build time incremental testing is possible with `add_custom_command` and `IMPLICIT_DEPENDS` using makefile generators
- Extend that capability to work
 - with non-makefile generators
 - at test time instead of at build time

Other Relevant Recent Work

- Subprojects in CDash
- ExternalProject module added to CMake 2.8
 - Several projects have adopted using this to build their pre-requisites using a “super build” approach
- Parallel testing (ctest -j N) added in version 2.8

Why CMake? It's fast

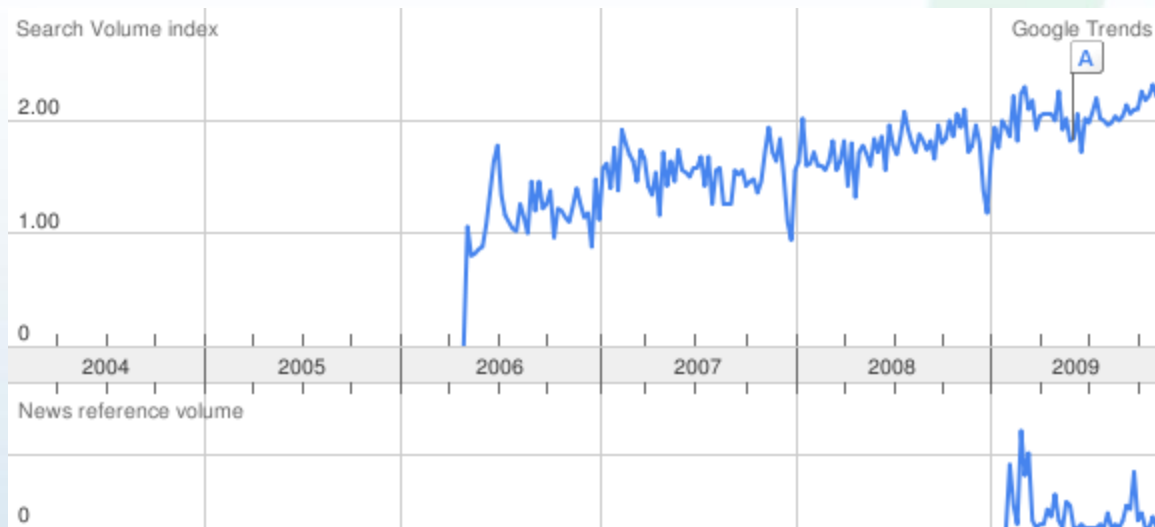
<http://blog.qgis.org/?q=node/16>

“I was quite surprised with the speed of building Quantum GIS codebase in comparison to Autotools.”

Task	CMake	Autotools
Configure	0:08	Automake: 0:41 Configure: 0:20
Make	12:15	21:16
Install	0:20	0:36
Total	12:43	22:43

Why CMake? Everyone is using it

KDE 2006 – Tipping Point!



- 1200+ downloads per day from www.cmake.org
- Major Linux distributions and Cygwin provide CMake packages
- KDE, Second Life, Boost (Experimentally), many others

Trilinos (Multi-Package Dashboard)

<http://trilinos.sandia.gov/cdash/index.php>

CDash - Trilinos - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://trilinos-dev.sandia.gov/cdash/index.php?project=Trilinos&date=20090430

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CDash - Trilinos

DASHBOARD CA **Main Project**

Project										
Project	Configure			Build			Test			Last submission
	Error	Warning	Pass	Error	Warning	Pass	Not Run	Fail	Pass	
Trilinos	0	0	208	1	117	91	0	8	5227	2009-04-30 12:54:32

SubProjects

Project	Configure			Build			Test			Last submission
	Error	Warning	Pass	Error	Warning	Pass	Not Run	Fail	Pass	
Teuchos	0	0	6	0	0	6	0	0	386	2009-04-30 16:59:38
RTOP	0	0	5	0	0	5	0	0	95	2009-04-30 17:00:49
Kokkos				0	0	5	0	0	10	2009-04-30 17:01:00
Epetra				0	3	2	0	0	128	2009-04-30 17:01:14
Zoltan				0	6	0	0	0	9	2009-04-30 18:08:12
Shards	0	0	5	0	5	0	0	0	20	2009-04-30 17:02:09
Intrepid	0	0	5	0	2	3	0	0	8	2009-04-30 17:10:38

Sub Projects

Done

Query Filters : customize views

CDash - Trilinos - Mozilla Firefox

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http://trilinos-dev.sandia.gov/cdash/index.php?project=Trilinos&display=project&filtercount=4&showfilter

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CMake - Cross Platform Make Capital District Youth Soccer League CDash - Trilinos

Trilinos Dashboard

DASHBOARD CALENDAR PREVIOUS CURRENT PROJECT

No file changed as of 2009-04-30T00:00:00 MDT [Help](#)

[\[Hide Filters\]](#)

Match of the following rules:

Build Name	is	Linux-GCC-4.1.2-MPI_DEBUG	-	+
Site	is	godel.sandia.gov	-	+
Build Time	is after	2009-04-30T10:58:53 MDT	-	+
Build Time	is before	2009-04-30T12:02:16 MDT	-	+

Nightly

Site	Build Name	Update		Configure			Build				Test				Build Time	Labels
		Files	Min	Error	Warn	Min	Error	Warn	Min	NotRun	Fail	Pass	Min			
godel.sandia.gov	Linux-GCC-4.1.2-MPI_DEBUG	0	0	0	0	0.1	0	0	1.2	0	0	40 +39	0.7	2009-04-30T11:40:16 MDT	Rythmos	
godel.sandia.gov	Linux-GCC-4.1.2-	0	0	0	0	0	0	0	0.1	0	0	7	0.1	2009-04-30T11:09:49	AsterCC	

Done

Kitware Hosted CDash

<http://my.cdash.org>

[Login](#) | [Register](#) | [Buy](#)

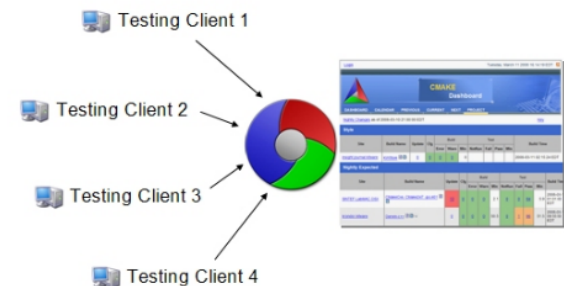


CDASH
Projects

CDash is a web-based software testing server. CDash **aggregates, analyzes and displays** the results of **software testing processes** submitted from clients located around the world. Developers depend on CDash to convey the state of a software system, and to continually improve its quality. To learn more about CDash visit the main [CDash website](#).

Starting a project is **easy and free**, in just a few clicks you can start monitoring the quality of your software development.

[Start My Project >](#)



Available Dashboards

Project	Description	Submissions	First build	Last activity
automoc4	automoc4 is a tool which makes moc-processing with Qt4 easier.	26	2009-04-18T12:33:22 EDT	2009-04-29 14:36:51
Avogadro	Avogadro is an advanced molecular editor designed for cross-platform use in computational chemistry, molecular modeling, bioinformatics, materials science, and related areas. It offers flexible rendering and a powerful plugin architecture.	57	2009-01-28T14:01:47 EST	2009-05-01 08:08:03
CERTI	CERTI	262	2008-09-26T18:27:04 EDT	2009-04-29 03:23:39
CERTI HLA TestsSuite	CERTI HLA TestsSuite	234	2008-09-26T17:23:43 EDT	2009-04-29 03:26:28
CMakePorts	A collection of popular open-source libraries which can be built using CMake	266	2009-03-05T20:28:33 EST	2009-05-01 01:35:47

Summary

- Kitware Pledges Support
- Many recently added features are relevant
- More work still to do!
- Links
 - <http://www.kitware.com>
 - <http://www.cmake.org>
 - <http://www.cdash.org>

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Thank You

