

# Качественная библиотека с нуля

## Инструменты, технологии и принятие в Boost

Antony Polukhin  
Полухин Антон

Boost libraries maintainer (LexicalCast, Any, TypeIndex, Conversion)  
+ Boost.CircularBuffer, Boost.Variant

# Содержание

## Общая часть:

- \* Идея
- \* Переносимость
- \* Лицензия
- \* Инструменты тестирования
- \* Документация
- \* Проверяем заинтересованность

## Boost специфичная часть:

- \* Требования
- \* The Review
- \* После принятия

# Идея



- \* найти проблему
- \* проверить существующие решения
- \* узнать как решать

# Идея

```
boost::function<int(int)> c_func = boost::dll::import<int(int)>(
    path_to_shared_library, "c_func_name"
);
int i = c_func(1);
```

# Переносимость

Чем лучше переносимость — тем больше пользователей.

- \* Платформы: Linux, Windows, MacOS, Android
- \* Стандарты: C++14 C++11 C++98

# C++14 Hana

```
namespace core_detail {
    template <typename Datatype>
    struct default_make {
        template <typename ...X>
        static constexpr auto apply_impl(int, X&& ...x)
            -> decltype(Datatype(detail::std::forward<X>(x)...))
        { return Datatype(detail::std::forward<X>(x)...); }

        template <typename ...X>
        static constexpr auto apply_impl(long, X&& ...) {
            static_assert((sizeof...(X), false),
                "there exists no constructor for the given data type");
        }

        template <typename ...X>
        constexpr decltype(auto) operator()(X&& ...x) const
        { return apply_impl(int{}, detail::std::forward<X>(x)...); }
    };
}

template <typename Datatype, typename = void>
constexpr auto make = make<Datatype, when<true>>>;

template <typename Datatype, bool condition>
constexpr core_detail::default_make<Datatype> make<Datatype, when<condition>>{};
```

# C++14 Hana

```
auto ts = make<Tuple>(1, '2', 3.3, std::string{"abcd"});  
BOOST_HANA_RUNTIME_ASSERT(ts == tuple(1, '2', 3.3,  
    std::string{"abcd"}));
```



# Лицензия

Цель вашей разработки:

- \* образовательная: LGPL Apache BSD MIT Boost
- \* для заработка: [A]GPL+Commercial
- \* для заработка в России: Commercial

Если вы клонировали чужой проект — вы не можете выбирать



# Тестирование

Тесты - это важно!

- запускайте их часто
- покрывайте весь функционал разработки
- используйте статические анализаторы

[illegible]

# Тестирование в Boost

## Test output: teeks99-08f-win2012R2-64on64 - variant - variant\_reference\_test / msvc-14.0

Rev 5e5e0342a901b42c3b3607cc8147fc2d4fb5f85b / Mon, 19 Jan 2015 20:22:51 +0000

Compile [2015-01-20 00:46:22 UTC]: **fail**

```
call "c:\users\boost\appdata\local\temp\boost_regression\b2_msvc_14.0_vcvarsall_x86.cmd" >nul
cl /Zm800 -nologo @"D:\local\teeks99-08f\results\boost\bin.v2\libs\variant\test\variant_reference_test.test\msvc-14.0\debug\asynch-exceptions-variant_reference_test.cpp
..\libs\variant\test\variant_reference_test.cpp(88): error C2784: 'boost::add_reference<T>::type wknd_get(boost::variant<T,> &,int)': could not
with
[
    T=int
]
..\libs\variant\test\variant_reference_test.cpp(47): note: see declaration of 'wknd_get'
..\libs\variant\test\variant_reference_test.cpp(111): note: see reference to function template instantiation 'void base_derived_test<int&,int>(U
with
[
    Derived=int
]
```

### Command Line

```
run.py --runner=teeks99-08f-win2012R2-64on64 --toolsets=msvc-14.0 \
"--bjam-options=\"-j2 address-model=64 define=BOOST_MSVC_ENABLE_2014_JUN_CTP --remove-test-targets\" \" \
--comment=..\info.html --tag=develop
```

## Tom Kent - runner: teeks99-02

Contact me: [REDACTED]@yahoo.com, [REDACTED]

This runner is a VM on a KVM/QEMU Virtual Machine. Its has 6GB of ram and 2 CPU Cores.  
This is running the 64-bit version of Windows Server 2008r2.

# Тестирование на Github

## Test results

Branches	Build	Tests coverage
Develop:	build passing	coverage 95%
Master:	build passing	coverage 95%

Static analysis (Coverity): coverity passed

- TravisCI
- Coveralls
- Coverity




# TravisCI

```
13  os:
14    - linux
15
31
32  matrix:
33    - CXX_STANDARD=c++98
34    - CXX_STANDARD=c++0x
35
36  addons:
37    coverity_scan:
38      # Mail to send notification to
39      notification_email: [REDACTED]
40
41      # This specifies the branch pattern for Coverity tests. If git branch and pattern mismatch,
42      # then coverity won't run. Set to `branch_pattern: $TRAVIS_BRANCH` if you want to do analysis on each build.
43      #branch_pattern: disable_coverity_scan
44      branch_pattern: $TRAVIS_BRANCH
45
46  #####
47  # From this point and below code is same for all the Boost libs
48  #####
49    build_command_prepend: "echo $COV_BUILD_OPTIONS $COVERITY_SCAN_BUILD_COMMAND"
50    build_command:  "../.../b2 cxxflags=--coverage\ -std=$CXX_STANDARD linkflags=--coverage "
51    project:
52      name: "$TRAVIS_REPO_SLUG"
53      description: "Build submitted via Travis CI"
54
55
56  before_install:
57    # Set this to the name of the library
58    - PROJECT_TO_TEST=`basename $TRAVIS_BUILD_DIR`
59    - echo "Testing $PROJECT_TO_TEST"
```

# TravisCI

apolukhin/Boost.DLL 

build **passing**

 Settings ▾

Current

Build History

Pull Requests

Branch Summary




**develop** - Coverity tool experiments (no 1)

 #114 passed

 ran for 20 min 37 sec



 19 minutes ago

 Commit fd93bec

 Compare c16a1a8..fd93bec

 Antony Polukhin authored and committed

## Build Matrix

Job	Duration	Finished	ENV	OS
 <a href="#">114.1</a>	10 min 29 sec	19 minutes ago	CXX_STANDARD=c++98	linux
 <a href="#">114.2</a>	10 min 8 sec	19 minutes ago	CXX_STANDARD=c++0x	linux



# TravisCI

```
2159 **passed** ../../bin.v2/libs/Boost.DLL/test/getting_started.test/gcc-4.6/debug/threading-  
multi/getting_started.test  
2160 common.mkdir ../../bin.v2/libs/Boost.DLL/test/tutorial1.test  
2161 common.mkdir ../../bin.v2/libs/Boost.DLL/test/tutorial1.test/gcc-4.6  
2162 common.mkdir ../../bin.v2/libs/Boost.DLL/test/tutorial1.test/gcc-4.6/debug  
2163 common.mkdir ../../bin.v2/libs/Boost.DLL/test/tutorial1.test/gcc-4.6/debug/threading-multi  
2164 gcc.compile.c++ ../../bin.v2/libs/Boost.DLL/test/tutorial1.test/gcc-4.6/debug/threading-  
multi/tutorial1.o  
2165 gcc.link ../../bin.v2/libs/Boost.DLL/test/tutorial1.test/gcc-4.6/debug/threading-multi/tutorial1  
2166 testing.capture-output ../../bin.v2/libs/Boost.DLL/test/tutorial1.test/gcc-4.6/debug/threading-  
multi/tutorial1.run  
2167 **passed** ../../bin.v2/libs/Boost.DLL/test/tutorial1.test/gcc-4.6/debug/threading-  
multi/tutorial1.test  
2168 common.mkdir ../../bin.v2/libs/Boost.DLL/test/tutorial2.test  
2169 common.mkdir ../../bin.v2/libs/Boost.DLL/test/tutorial2.test/gcc-4.6  
2170 common.mkdir ../../bin.v2/libs/Boost.DLL/test/tutorial2.test/gcc-4.6/debug  
2171 common.mkdir ../../bin.v2/libs/Boost.DLL/test/tutorial2.test/gcc-4.6/debug/threading-multi  
2172 gcc.compile.c++ ../../bin.v2/libs/Boost.DLL/test/tutorial2.test/gcc-4.6/debug/threading-  
multi/tutorial2.o  
2173 gcc.link ../../bin.v2/libs/Boost.DLL/test/tutorial2.test/gcc-4.6/debug/threading-multi/tutorial2  
2174 testing.capture-output ../../bin.v2/libs/Boost.DLL/test/tutorial2.test/gcc-4.6/debug/threading-  
multi/tutorial2.run  
2175 **passed** ../../bin.v2/libs/Boost.DLL/test/tutorial2.test/gcc-4.6/debug/threading-
```

# Coveralls

## COVERALLS

HOME

FEATURES

SIGN UP

PRICING

DOCS

BLOG

SIGN IN

APOLUKHIN / BOOST.DLL

95%

BRANCH: DEVELOP

GITHUB REPO

## LATEST BUILDS

BUILD	BRANCH	COVERAGE	COMMIT	COMMITTER	TYPE	TIME	VIA
#114	develop	94.63	Coverity tool experiments (no 1)	apolukhin	push	15 Jan 2015	travis-ci
#113	develop	94.63	Attempt(no 11) to use coverity tool	apolukhin	push	13 Jan 2015	travis-ci
#112	develop	94.63	Attempt(no 10) to use coverity tool	apolukhin	push	13 Jan 2015	travis-ci
#111	develop	94.63	Attempt(no 9) to use coverity tool	apolukhin	push	13 Jan 2015	travis-ci
#110	develop	94.63	Attempt(no 8) to use coverity tool	apolukhin	push	13 Jan 2015	travis-ci
#109	develop	94.63	Attempt(no 7) to use coverity tool	apolukhin	push	13 Jan 2015	travis-ci
#104	develop	46.08	Attempt(no 2) to use coverity tool	apolukhin	push	13 Jan 2015	travis-ci



# Coveralls

## FILES

SEARCH:

ALL 15

CHANGED 0

SOURCE CHANGED 0

COVERAGE CHANGED 0

SHOW 10 ENTRIES

COVERAGE	FILE	LINES	RELEVANT	COVERED	MISSED	HITS/LINE
+ 50.0	...-local/boost/dll/detail/posix/path_from_handle.hpp	45	6	3	3	27.0
+ 73.33	...home/travis/boost-local/boost/dll/library_info.hpp	168	45	33	12	4.0
+ 96.67	...cal/boost/dll/detail/posix/shared_library_impl.hpp	176	60	58	2	53.0
+ 98.86	...me/travis/boost-local/boost/dll/shared_library.hpp	496	88	87	1	19.0
+ 98.91	...e/travis/boost-local/boost/dll/detail/elf_info.hpp	270	92	91	1	90.0
+ 100.0	.../boost-local/boost/dll/detail/x_info_interface.hpp	32	2	2	0	4.0
+ 100.0	...avis/boost-local/boost/dll/detail/system_error.hpp	49	5	5	0	4.0
+ 100.0	...l/boost/dll/detail/posix/program_location_impl.hpp	107	2	2	0	29.0
+ 100.0	...ost-local/boost/dll/detail/aggressive_ptr_cast.hpp	44	1	1	0	64.0
+ 100.0	...boost-local/boost/dll/shared_library_load_mode.hpp	239	5	5	0	130.0

SHOWING 1 TO 10 OF 15 ENTRIES

# Coveralls

```
18  #ifdef BOOST_HAS_PRAGMA_ONCE
19  # pragma once
20  #endif
21
22  namespace boost { namespace dll { namespace detail {
23
24      inline boost::filesystem::path path_from_handle(void* handle, 27x
        boost::system::error_code &ec) {
25          // RTLD_DI_LINKMAP (RTLD_DI_ORIGIN returns only folder and is not suitable for
this case)
26          // Obtain the Link_map for the handle that is specified.
27          // The p argument points to a Link_map pointer (Link_map
28          // **p). The actual storage for the Link_map structure is
29          // maintained by ld.so.1.
30          const struct link_map * link_map;
31          if (dldinfo(handle, RTLD_DI_LINKMAP, &link_map) < 0) { 27x
32              ec = boost::system::error_code(
33                  boost::system::errc::bad_file_descriptor,
34                  boost::system::generic_category() !
35              ); !
36
37              return boost::filesystem::path(); !
38          }
39
40          return boost::filesystem::path(link_map->l_name); 27x
41      }
```

# Coverity

apolukhin-Boost.DLL

Help

Guided Tour

Return to Dashboard

antoshkka@gmail.com

Enter CID(s)

Issues: By Snapshot | Unsaved view

Filters: CID

CID	Type	Impact	Status	Count	First Detected	Owner	Classification	Sev
All 1 issue selected								
Page 1 of 1								

path.hpp

```
636 // iterator_facade derived classes don't seem to like implementations in
637 // separate translation unit dll's, so forward to class path static members
638 void increment() { m_path_iterator_increment(*this); }
639 void decrement() { m_path_iterator_decrement(*this); }
640
641 path m_element; // current element
642 const path* m_path_ptr; // path being iterated over
643 string_type::size_type m_pos; // position of m_element in
644 // m_path_ptr->m_pathname.
645 // if m_element is implicit dot, m_pos is the
646 // position of the last separator in the path.
647 // end() iterator is indicated by
648 // m_pos == m_path_ptr->m_pathname.size()
649 }; // path::iterator
650
651 //-----//
652 // //
653 // non-member functions //
654 // //
655 //-----//
656
657 // std::lexicographical_compare would infinitely recurse because path iterators
658 // yield paths, so provide a path aware version
```

**100634 Uninitialized pointer field**

The pointer field will point to an arbitrary memory location, any attempt to write may cause corruption.

In boost::filesystem::path::iterator::iterator(): A pointer field is not initialized in the constructor (CWE-457)

Triage

Classification:

Severity:

Action:

Ext. Reference:

Owner:

Enter comments (See the History section below for previous comments)

Apply + Next

Apply

Projects & Streams

Detection History

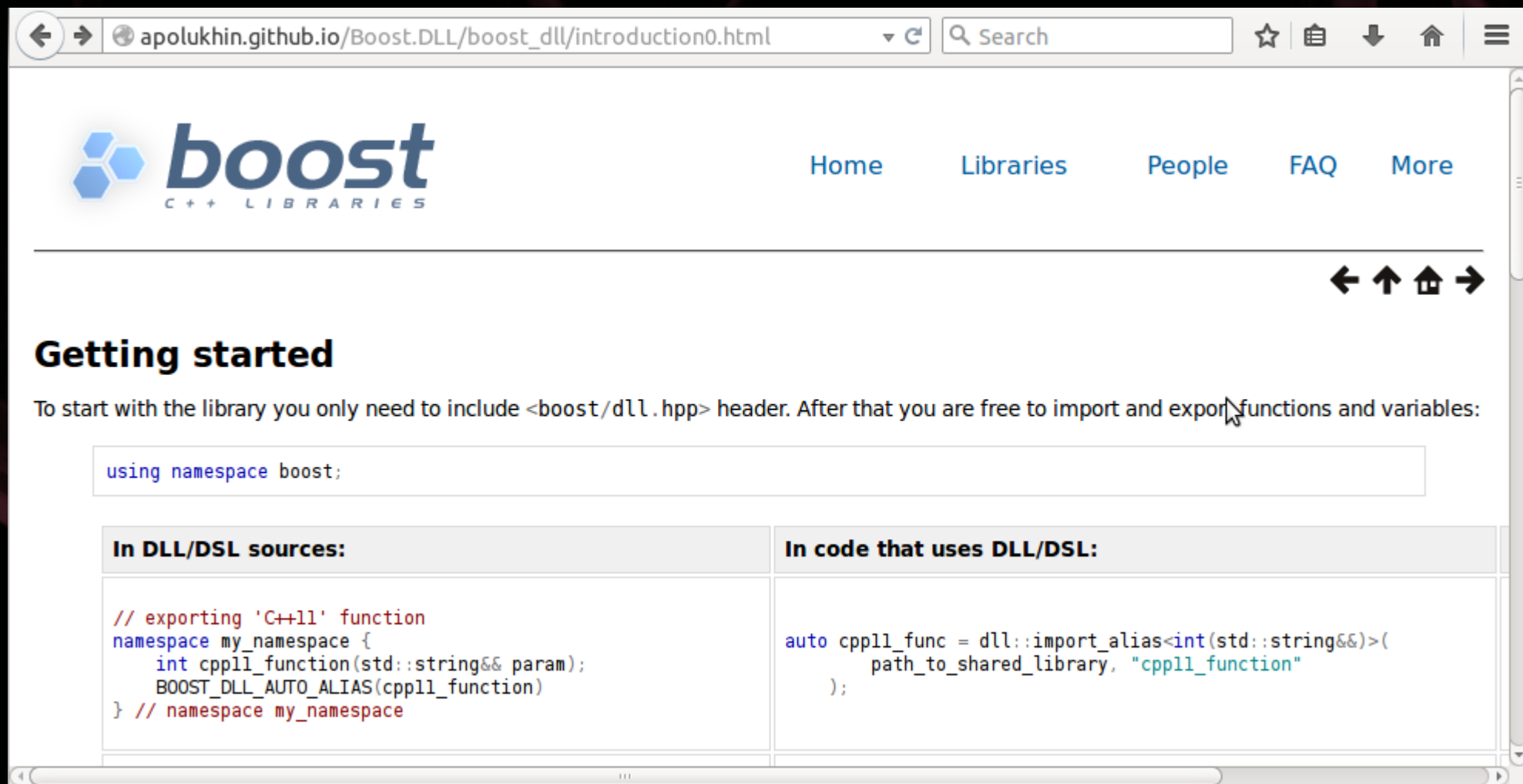
Triage History

Occurrences



# Документация

- \* ветка `gh-pages`
- \* пишем в неё HTML
- \* PROFIT:



The screenshot shows a web browser window displaying the Boost C++ Libraries documentation page for Boost.DLL. The browser's address bar shows the URL `apolukhin.github.io/Boost.DLL/boost_dll/introduction0.html`. The page features the Boost logo and navigation links: Home, Libraries, People, FAQ, and More. Below the navigation bar, there are navigation icons (back, forward, home, search). The main heading is "Getting started". The text below the heading states: "To start with the library you only need to include `<boost/dll.hpp>` header. After that you are free to import and export functions and variables:". Below this text, there is a code block containing the following C++ code:

```
using namespace boost;
```

In DLL/DSL sources:	In code that uses DLL/DSL:
<pre>// exporting 'C++11' function namespace my_namespace {     int cpp11_function(std::string&amp;&amp; param);     BOOST_DLL_AUTO_ALIAS(cpp11_function) } // namespace my_namespace</pre>	<pre>auto cpp11_func = dll::import_alias&lt;int(std::string&amp;&amp;)&gt;(     path_to_shared_library, "cpp11_function" );</pre>



# Документация

- \* Мотивация
- \* Быстрый старт
- \* Tutorial
- \* Справочная документация
- \* Как собирать
- \* Обоснование решений

# Проверяем заинтересованность

- \* комментарии на API
- \* просьбы по улучшению документации
- \* отличные идеи и полезные ссылки

```
// Class `library_info` can extract information from a library  
boost::dll::library_info inf(libraries[i]);  
  
// Getting symbols exported from 'Anna' section  
std::vector<std::string> exports = inf.symbols("Anna");
```

Вы не обязаны реализовывать все идеи!

# Принятие в Boost

- \* Требования:

<http://www.boost.org/development/requirements.html>

- \* Boost Library Incubator

<http://blincubator.com/>

- \* Ревью менеджер/Review manager

# The Review





# После принятия



# Конец



Для рекламы || заработка  
<http://top-me.org/>