



# The Eclipse C/C++ IDE Projects and Ecosystem

EclipseCon 2011

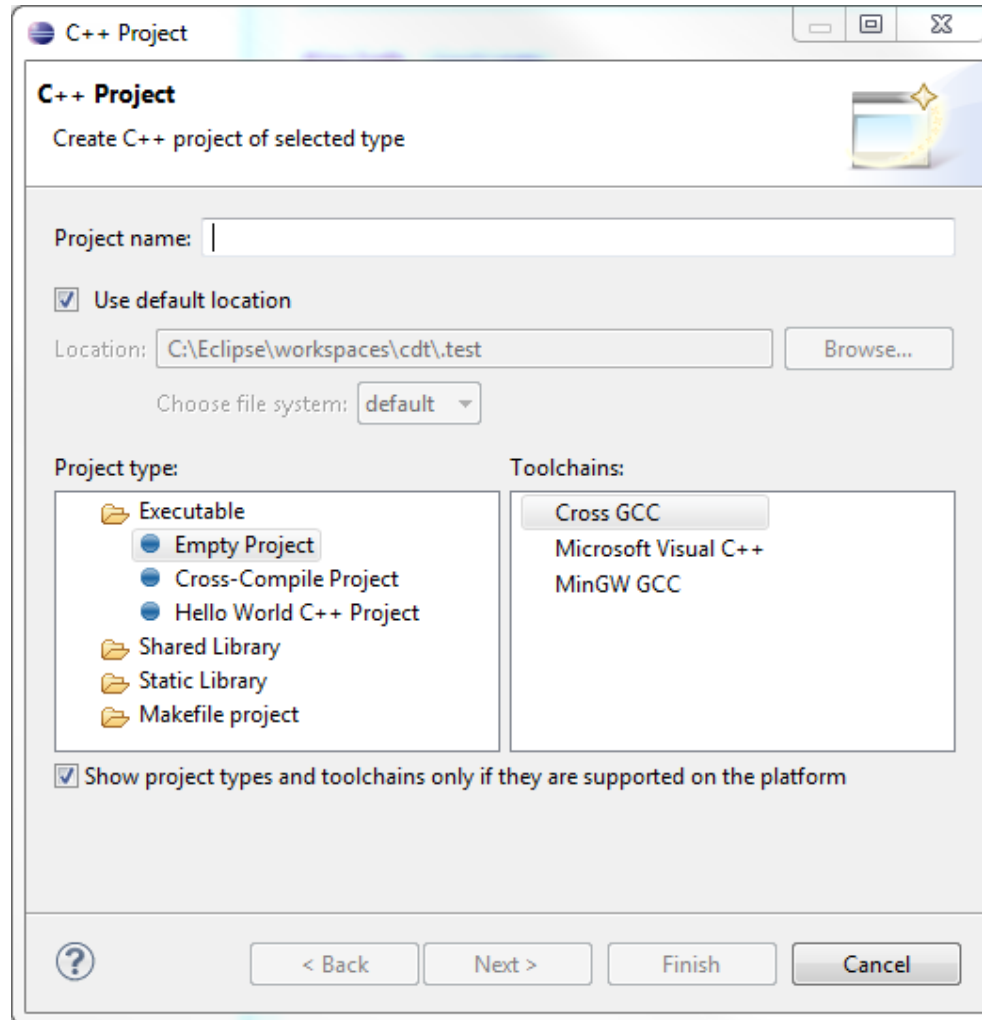
Doug Schaefer, Wind River Systems  
CDT Project Lead

# Where did the CDT come from?

- Started as a fork of JDT but for C/C++
- QNX contributed initial code and started community in 2002
- Focus on enabling integration with external tools
  - Compilers and debuggers
- JDT set the bar for functionality and usability
- Java Native debugging the holy grail

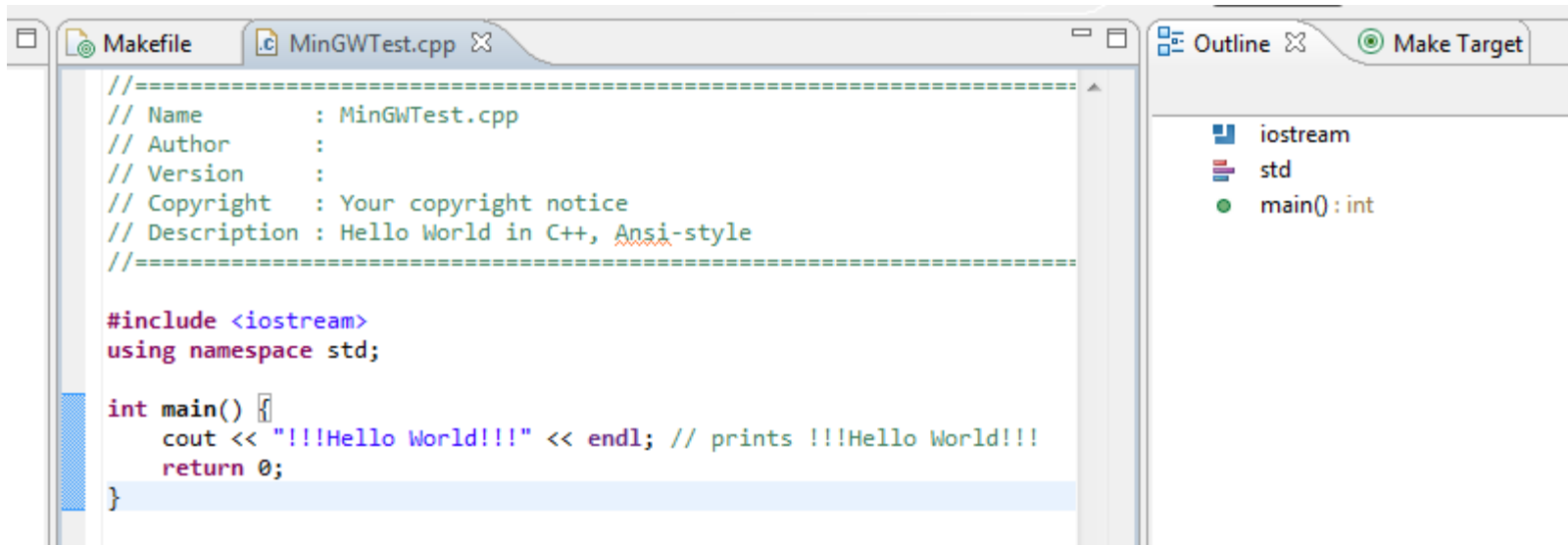


# What is CDT? - C and C++ Projects



# What is CDT? Editor

- Keyword highlighting, bracket matching
- Outline View, Content assist



The screenshot displays the Eclipse IDE interface. The main editor window shows the source file `MinGWTest.cpp` with the following code:

```
//=====
// Name      : MinGWTest.cpp
// Author    :
// Version   :
// Copyright : Your copyright notice
// Description: Hello World in C++, Ansi-style
//=====

#include <iostream>
using namespace std;

int main() {
    cout << "!!!Hello World!!!" << endl; // prints !!!Hello World!!!
    return 0;
}
```

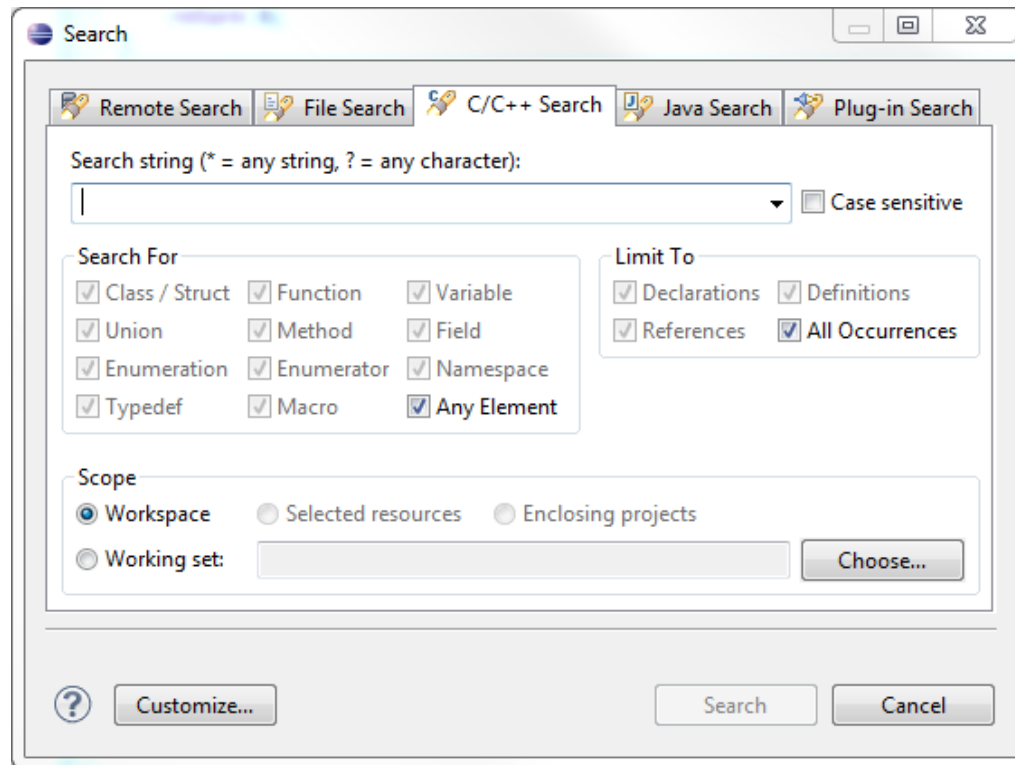
The Outline View on the right side of the IDE shows the following structure:

- iostream
- std
- main() : int

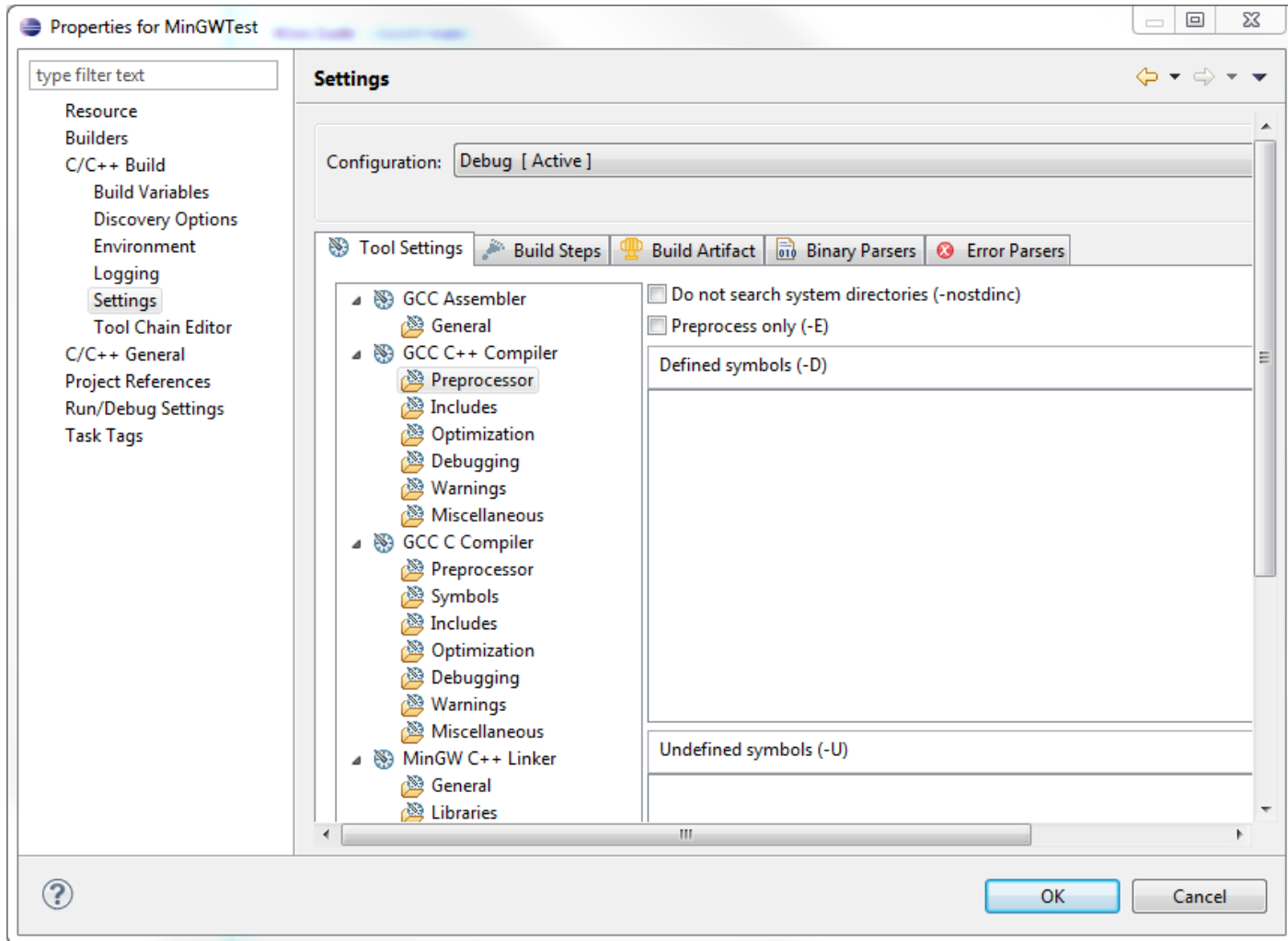


# What is CDT? Source Navigation

- Open Declaration, C/C++ Search
- Call hierarchy, Type Hierarchy, Includes browser



# What is CDT? Build



# What is CDT? Debug

The screenshot displays the Eclipse IDE interface during a debug session. The main editor shows the source code of `MinGWTest.cpp`:

```
//-----  
  
#include <iostream>  
using namespace std;  
  
int main() {  
    string blah = "Hello World!";  
    cout << blah << endl; // prints !!!Hello World!!!  
    return 0;  
}
```

The Console view shows the output: `Hello World!`

The Variables view shows the following variables:

Name	Type
blah	std::string
npos	const std::basic_string<char, std::char_traits<char>, std::allocator<char>>
_M_dataplus	std::basic_string<char, std::char_traits<char>, std::allocator<char>>
std::allocator<char>	std::allocator<char>
_M_p	char *

The Registers view shows the following registers:

Name	Value	Description
General Registers		General Purpose
eax	1875677920	
ecx	1995456901	
edx	2684964	
ebx	2130567168	

The Memory view shows the memory address `0x5819F4` containing the string `Hello World!`:

Address	0 - 3	4 - 7	8 - B	C - F
005819F0	...	Hell	o Wo	rld!
00581A00	««««	««««	«bip	ipip
00581A10	...	...	@0fl<	"o
00581A20	Ä X	TX	ipip	ipip
00581A30	ipip	ipip	ipip	ipip
00581A40	ipip	ipip	ipip	ipip



# GNU Tools as Exemplary Integration

- Available for almost all platforms
- Show the proper way to do tool integrations
- Many ecosystem companies leverage this integration
  - Especially in embedded world
- As CDT evolved, so did GNU tools
  - Now a world class combination with gcc and gdb
  - A first class IDE for Linux
  - But can also be used with Windows (MinGW or Cygwin)
  - Apple (more on that later)





# Eclipse C/C++ IDE

## Eclipse IDE for C/C++ Developers

### Package Details

An IDE for C/C++ developers with Mylyn integration.

### Feature List

org.eclipse.cdt	7.0.0
org.eclipse.cdt.debug.ui.memory	
org.eclipse.cdt.mylyn	
org.eclipse.cdt.p2	
org.eclipse.cdt.platform	7.0.0
org.eclipse.cvs	1.1.0
org.eclipse.epp.package.common.feature	
org.eclipse.equinox.p2.user.ui	1.1.0
org.eclipse.help	1.1.0
org.eclipse.mylyn.bugzilla_feature	
org.eclipse.mylyn.context_feature	
org.eclipse.mylyn.ide_feature	
org.eclipse.mylyn.team_feature	
org.eclipse.mylyn.wikitext_feature	
org.eclipse.mylyn_feature	
org.eclipse.platform	3.6.0
org.eclipse.rcp	3.6.0

### Download Links

[Windows 32-bit](#)  
[Windows 64-bit](#)  
[Mac OS X\(Cocoa 32\)](#)  
[Mac OS X\(Cocoa 64\)](#)  
[Linux 32-bit](#)  
[Linux 64-bit](#)

Downloaded 609,340 Times

▶ [Checksums...](#)

### Bugzilla

▶ [Open Bugs: 17](#)  
▶ [Resolved Bugs: 15](#)  
[File a Bug on this Package](#)

### New and Noteworthy

[Eclipse CDT](#)  
[Eclipse Platform](#)  
[Eclipse Mylyn](#)



# Eclipse C/C++ IDE

- C/C++ IDE for Linux Developers also available
  - Adds autoconf, Linux profiling tools
- Indigo additions for C/C++ IDE Package
  - Microsoft Visual C++ toolchain support
  - Embedded development support
    - including RSE, TCF, cross gnu tools integration



# C/C++ Family at Eclipse

- Linux Tools Project
  - Tools for Linux Developers
- Target Communication Framework
  - Protocol and Service Framework for Targets
- Target Management
  - Terminal View, Remote Systems Explorer
- Parallel Tools Project
  - Tools for High Performance computing
- Sequoyah Tools for Mobile Project
  - Native tools for mobile platforms



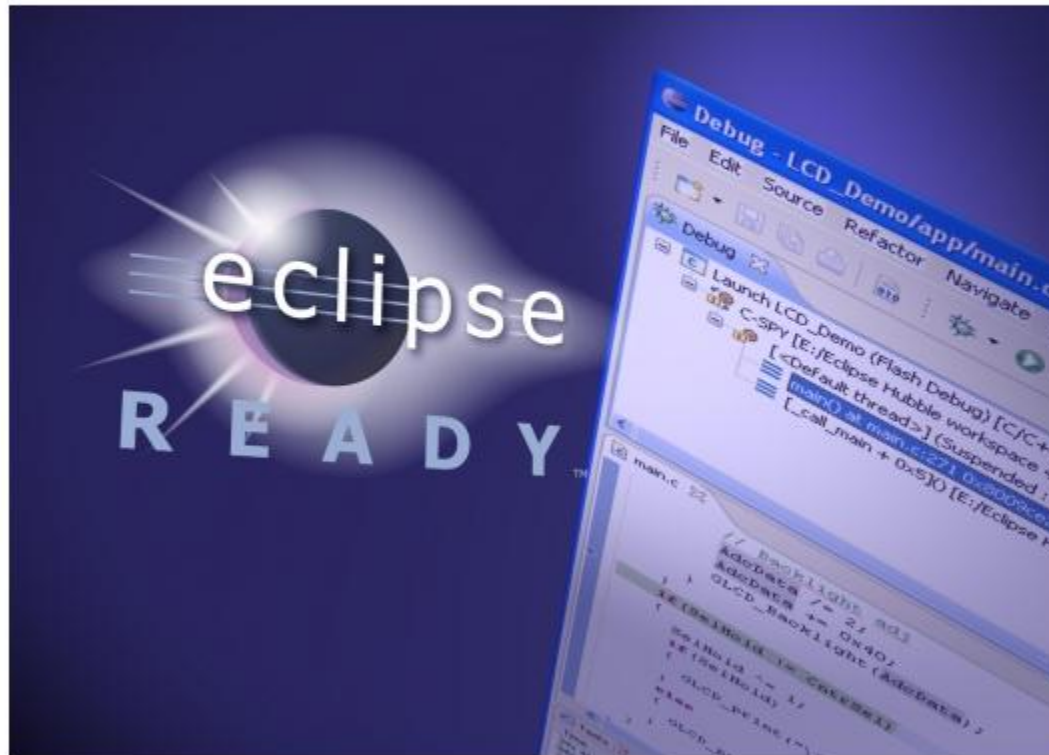
# The Greater Ecosystem

- Embedded Platform Vendors
  - Wind River Workbench
  - QNX Momentics
  - Texas Instruments Code Composer
  - Nokia Carbide
  - Montavista Dev Rocket
  - and many, many more
- Open Source Platforms
  - Linux Distros
  - Yocto Embedded Linux
  - Android



# And the Ecosystem keeps Growing!

IAR Systems addresses growing user community with Eclipse integration



Embedded World 2011, Nuremberg, Germany, March 1st - 3rd - Hall 10.209



# The Rise of the User

- User contributions to CDT on the rise
  - Ericsson
  - Google
  - Broadcom
  - A handful of small independents
- Focused mainly on improving quality
  - Make sure CDT works for their users
- Hugely important to the Eclipse ecosystem



# What's happening in CDT today?

- Codan static analysis
- Multi-core Debug
  - Pin and clone views to debug contexts
  - Debug element grouping
  - Gdb multi-context support
- General quality improvements
  - Scanner Discovery clean-up
  - Build scalability
  - Platform build configurations
  - Refactoring improvements



# What cool things could we do?

- Java native debugging still holy grail
  - Should be important for Android, Eclipse
- Apple platform support
  - As alternative to Xcode
  - Support for Objective-C
- Windows Platform
  - Debugging to go along with Visual C++ build support
  - C#?
- External builders support
  - CMake, SCons, Jam





# Areas that need work

- Build UI and Workflows
- Refactoring coverage and quality
- Codan code checkers and quick fix
- Scalability to massive projects



# C/C++ Alive and Well at Eclipse

- To the 25+ committers and countless contributors who bring the C/C++ IDE to you.

Thank you!

