

C++ & software engineering

Martin Halfar
Juraj Michálek

14.12. 2015
FI MUNI - Brno

Grab the source code

[**https://github.com/ysoftdevs/cpp-examples**](https://github.com/ysoftdevs/cpp-examples)



We should be taught not to wait for inspiration to start a thing.
Action always generates inspiration.

- Frank Tibolt

Write failing
acceptance
test



Write a
failing
unit test

Make the
test pass

Refactor

Understand
the problem



Broad-Brush
Design
(Architectue)



Automate:

- build
- deployment
- end-to-end tests



Write failing
acceptance
test



Refactor

Know your tool

Developer

....or

Engineer

Embedded systems developer

Proprietary Embedded Technologies

C#, CSS 3.0, ECMAScript 6, Java 1.4, C++

TDD, BDD

Git



gradle, grunt



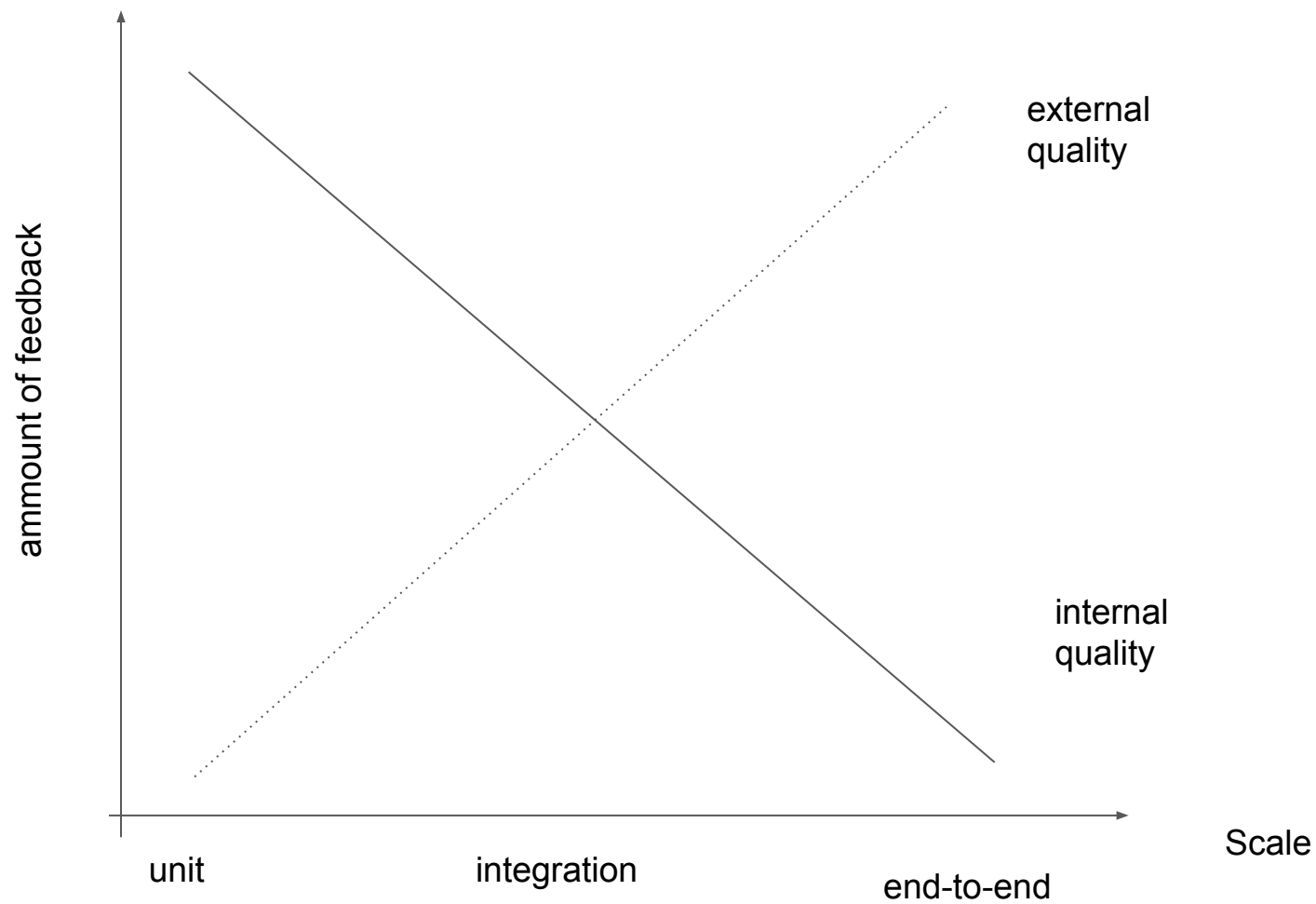
Nuget, Sonatype Nexus, Npm, Private Bower Registry

Web Services - SOAP, REST



Is it live yet?

- Important is communication before and during development
 - Focus groups, Elaboration helps before development
 - Code review and pull requests helps during development
- Important are results
 - Technology dept
 - Maintenance cost
 - Role of customer (real customer, product manager, architect), technical lead, senior developer



Conway's law

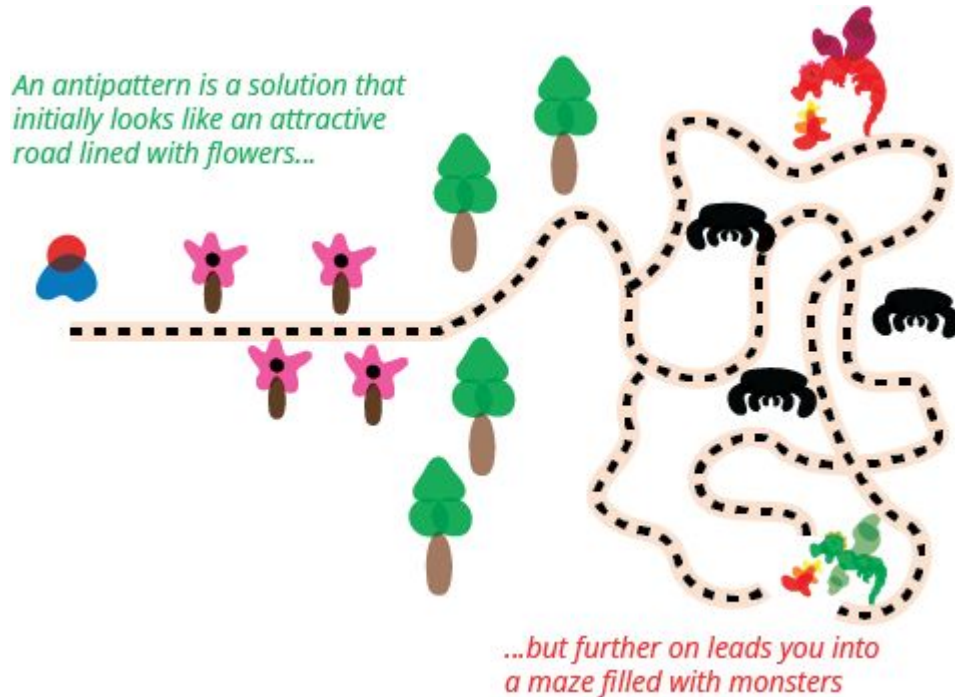
organizations which design systems ... are constrained to produce designs which are copies of the communication **structures** of these organizations

Martin Fowler - Microservices (2015)

<https://youtu.be/2yko4TbC8cl>

Antipattern

<http://martinfowler.com/bliki/AntiPattern.html>



Chaos Monkey



Podcasts

Channel9 - <https://channel9.msdn.com/>

Hanselminutes - <http://hanselminutes.com/>

CppCast - <http://cppcast.com/>

Devminutes - <http://devminutes.cz/>

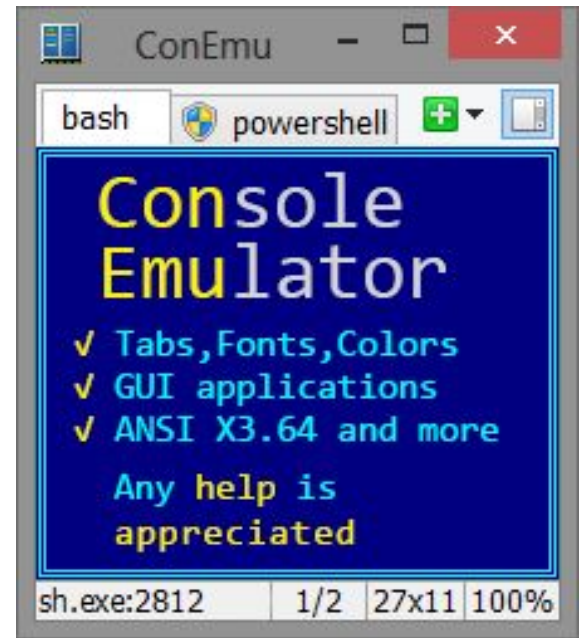
.NetRocks - <https://www.dotnetrocks.com/>

Conemu Maximus 5

Powerful terminal for Windows

use with PowerShell, Python, Ruby...

<https://code.google.com/p/conemu-maximus5/>





CMake 3.0.2

By: scaftw

CMake is a family of tools designed to build, test and package software. CMake is used to control the software compilation process using simple platform and compiler independent configuration files. CMake generates native makefiles and workspaces that can be used in the compiler environment of your choice.

3,884 downloads | Tags [make](#) [build](#) [test](#) [package](#)

```
C:\> choco install cmake
```

Yum/Apt-like installation of Win packages

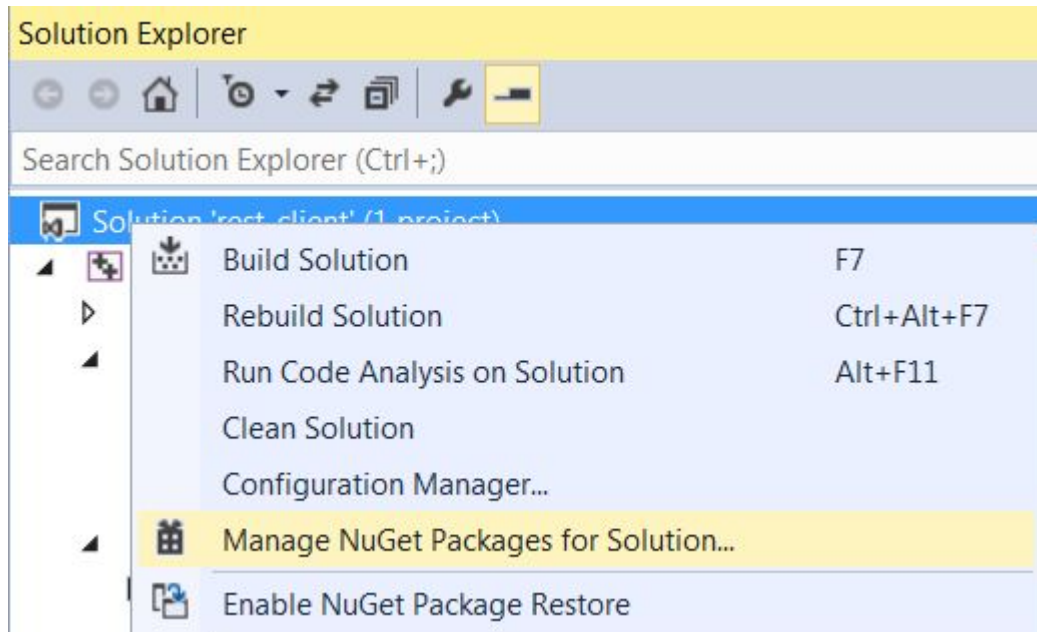
<https://chocolatey.org>

NuGet - <http://www.nuget.org>

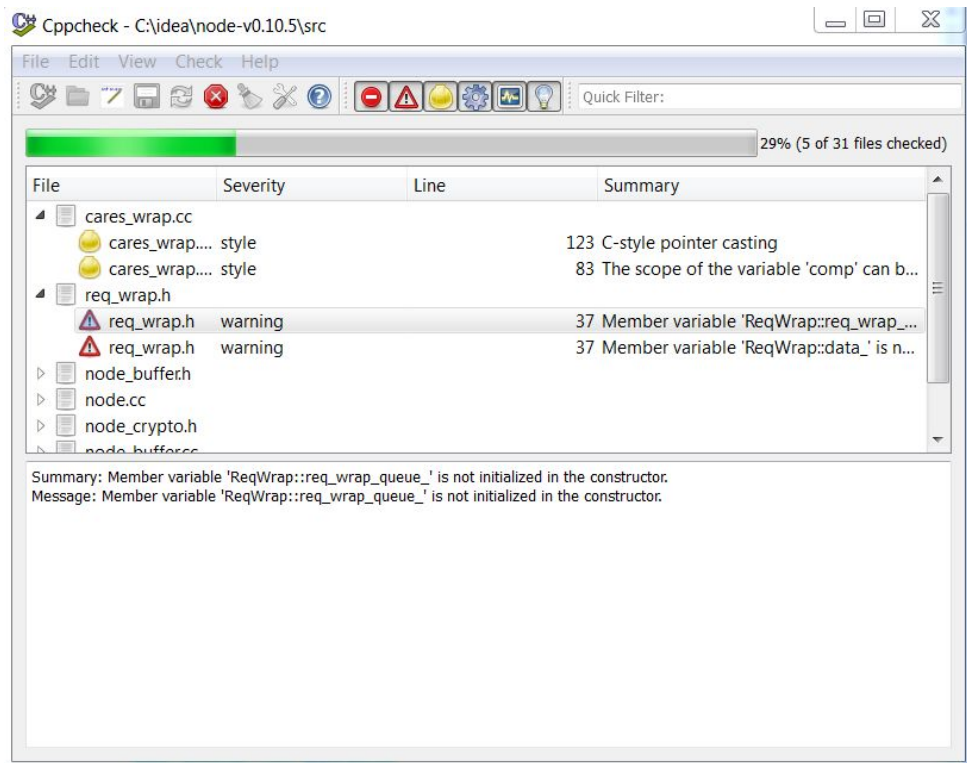




NuGet.Tools.2013



Cppcheck



Continuous integration

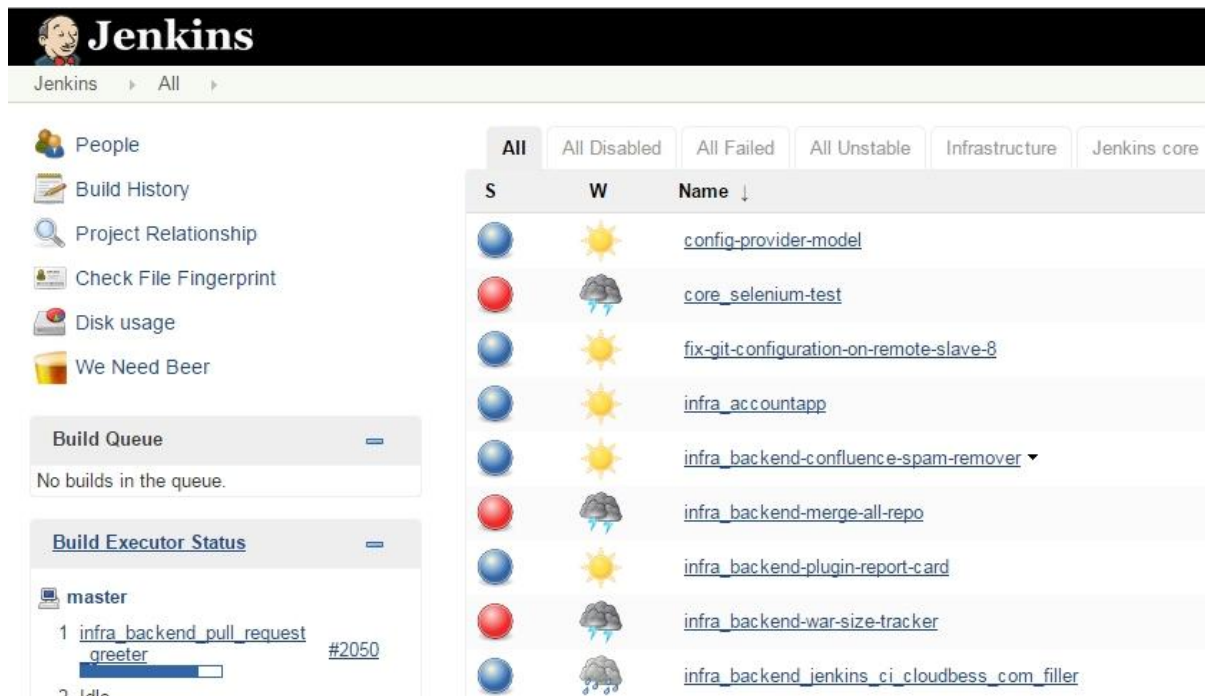


Jenkins



TeamCity

Jenkins

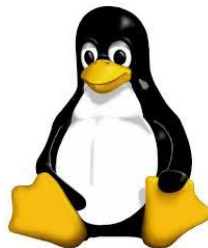


The screenshot shows the Jenkins web interface. The top header features the Jenkins logo and the word "Jenkins". Below the header, there's a navigation bar with "Jenkins" and "All" links. The left sidebar contains several menu items: "People", "Build History", "Project Relationship", "Check File Fingerprint", "Disk usage", and "We Need Beer". Below these are two expandable sections: "Build Queue" (showing "No builds in the queue.") and "Build Executor Status" (showing a list of executors, including "master" with a build "infra_backend_pull_request" in progress). The main content area displays a table of builds, filtered by "All". The table has columns for status (S), weather icon (W), and name. The builds listed include "config-provider-model", "core_selenium-test", "fix-git-configuration-on-remote-slave-8", "infra_accountapp", "infra_backend-confluence-spam-remover", "infra_backend-merge-all-repo", "infra_backend-plugin-report-card", "infra_backend-war-size-tracker", and "infra_backend_jenkins_ci_cloudbess_com_filler".

S	W	Name ↓
		config-provider-model
		core_selenium-test
		fix-git-configuration-on-remote-slave-8
		infra_accountapp
		infra_backend-confluence-spam-remover ▼
		infra_backend-merge-all-repo
		infra_backend-plugin-report-card
		infra_backend-war-size-tracker
		infra_backend_jenkins_ci_cloudbess_com_filler

Hit for Windows users: Do not install Jenkins into path with special characters and blank space.
E.g: Wrong: C:\Program Files (x86)\Jenkins. Correct: Use C:\projects\jenkins

maven



Dashboard view

Project	Plan	Build	Completed	Tests	Reason
▼ Aura	Check resources	✓ #9	4 days ago	No tests found	Changes by uhliarik
	Documentation	✓ #26	16 hours ago	No tests found	Scheduled
▼ Cronos	Check resources	✓ #24	21 minutes ago	No tests found	Changes by dolejsi
	Documentation	✓ #14	14 hours ago	No tests found	Scheduled
	SafeQ	⊖ #140	1 week ago	No tests found	Changes by dolejsi

Plan summary

 Build projects / Cronos
Check resources
Check resources integrity

✓

✓

✓

✓

✓

✓

✓

✓

✓

✓

▶ Run ▼

⚙ Actions ▼

Plan summary

Recent failures

History

Tests

Issues

Plan summary

Showing Last 25 builds ▼

Current activity

No builds are currently running.

Recent history

Plan statistics

23

builds

95%

successful



Hierarchy

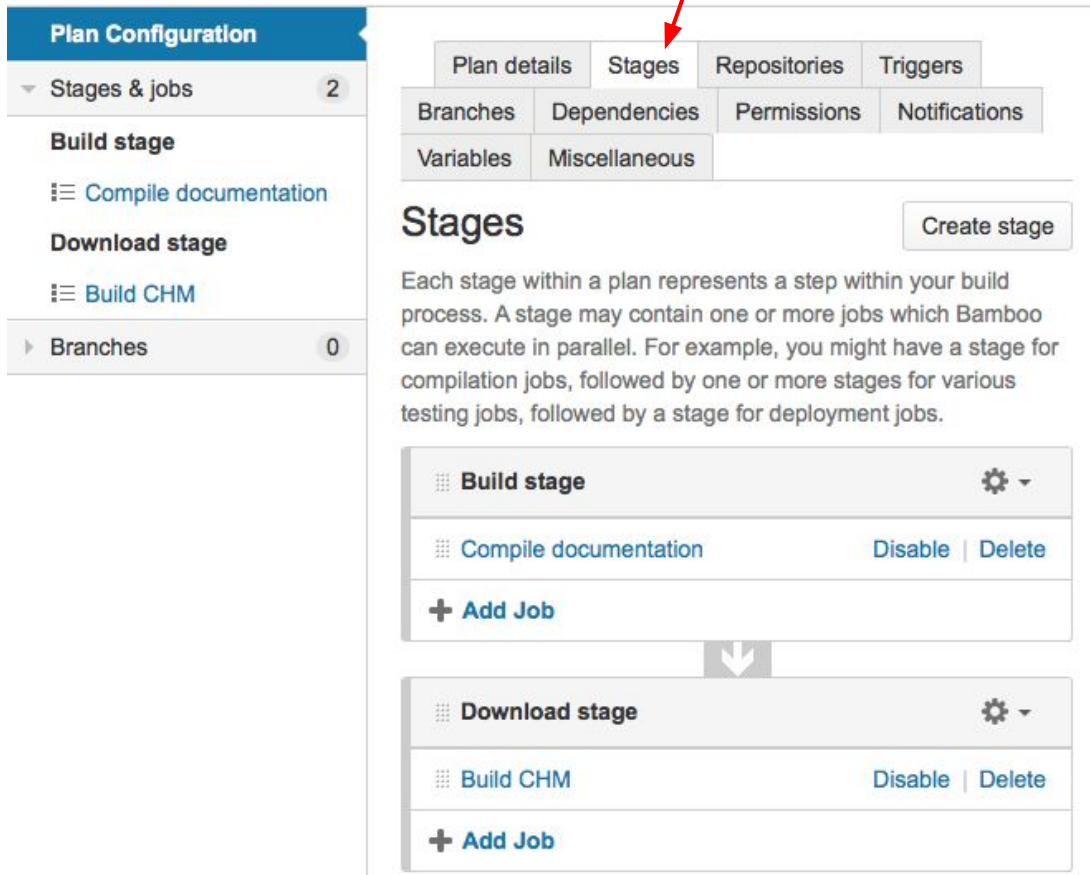
Plan

Stage

Job

Task

Stage



The screenshot displays the 'Plan Configuration' page in Bamboo. On the left, a sidebar shows 'Stages & jobs' with a count of 2, and 'Build stage' with sub-items 'Compile documentation' and 'Download stage'. Below this is 'Download stage' with sub-items 'Build CHM', and 'Branches' with a count of 0. The main content area has a tabbed interface with 'Stages' selected, indicated by a red arrow. Other tabs include 'Plan details', 'Repositories', 'Triggers', 'Branches', 'Dependencies', 'Permissions', 'Notifications', 'Variables', and 'Miscellaneous'. The 'Stages' section is titled 'Stages' with a 'Create stage' button. A descriptive paragraph explains that each stage represents a step in the build process, can contain multiple jobs, and jobs can execute in parallel. Below the text, two stages are listed: 'Build stage' and 'Download stage'. Each stage has a list of jobs: 'Build stage' contains 'Compile documentation' and 'Download stage' contains 'Build CHM'. Each job has 'Disable' and 'Delete' links. A '+ Add Job' button is present at the bottom of each stage's job list. A downward arrow icon is positioned between the two stage blocks.

Plan Configuration

- Stages & jobs (2)
- Build stage
 - Compile documentation
- Download stage
 - Build CHM
- Branches (0)

Stages [Create stage](#)

Each stage within a plan represents a step within your build process. A stage may contain one or more jobs which Bamboo can execute in parallel. For example, you might have a stage for compilation jobs, followed by one or more stages for various testing jobs, followed by a stage for deployment jobs.

Build stage [Disable](#) [Delete](#)

- Compile documentation

[+ Add Job](#)

Download stage [Disable](#) [Delete](#)

- Build CHM

[+ Add Job](#)

No equivalent in our Jenkins

Agent capabilities

JDK

[Add JDK](#)

'JDK' capabilities define the JDKs which are available to your build plans.

JDK label	Java home	Operations
JDK	D:\Program Files (x86)\Java\jdk1.7.0_51	View Edit Delete
JDK 1.7	D:\Program Files (x86)\Java\jdk1.7.0_51	View Edit Delete
JDK 1.7.0_51	D:\Program Files (x86)\Java\jdk1.7.0_51	View Edit Delete
JDK 1.7.0_51 (JRE)	D:\Program Files\Java\jre7	View Edit Delete

Git

[Add Git](#)

The path to the Git executable (e.g. '**C:\Program Files (x86)\Git\git.exe**' or '**/usr/local/git/bin/git**')

Executable	Path	Operations
Git	C:\Program Files (x86)\git\cmd\git.exe	View Edit Delete

Focus

One agent - One job

No parallel executions on one Agent

Add-ons

Atlassian Marketplace for Bamboo



Discover powerful add-ons compatible with your Bamboo version via the Atlassian Marketplace. [Manage add-ons.](#)



Search results



All categories



Paid or free



Chuck Norris for Bamboo

Michael Rüegg • Vendor supported

BUILD MANAGEMENT



38 downloads

Free

Manage

This is the well-known Chuck Norris plug-in for Atlassian Bamboo. It displays a picture and a random programmer joke of Chuck Norris on each build page and on the Bamboo wallboard.

Chuck happy

Build summary

Tests

Commits

Artifacts

Logs

Metadata

Issues

Build result summary

Details

Completed 20 May 2014, 3:10:47 PM – 3 minutes ago

Duration 20 minutes

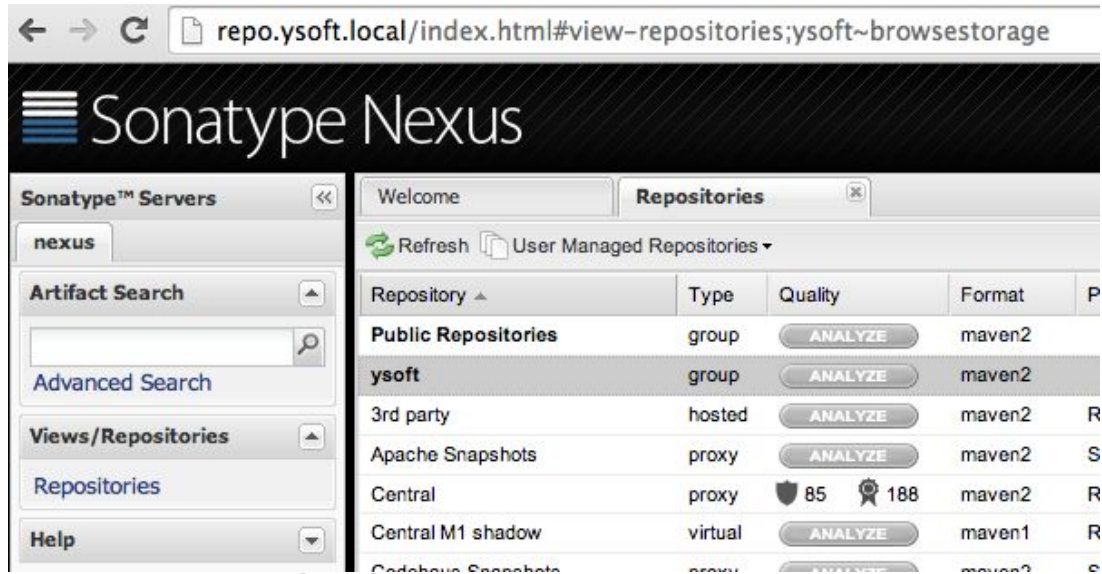
[Labels](#) None 

Show more



"Chuck Norris can't test for equality because he has no equal."

Artifacts to Nexus



Do not store binaries in Git/SVN!

exe, fonts, big files, jars...

IDE & Text editors

Ideone.com

</> source code

```
1 #include <iostream>
2 using namespace std;
3
4 int main() {
5     // your code goes here
6     cout << "Hello" << endl;
7     return 0;
8 }
```

 input  Output

Success time: 0 memory: 3296 signal:0

Hello

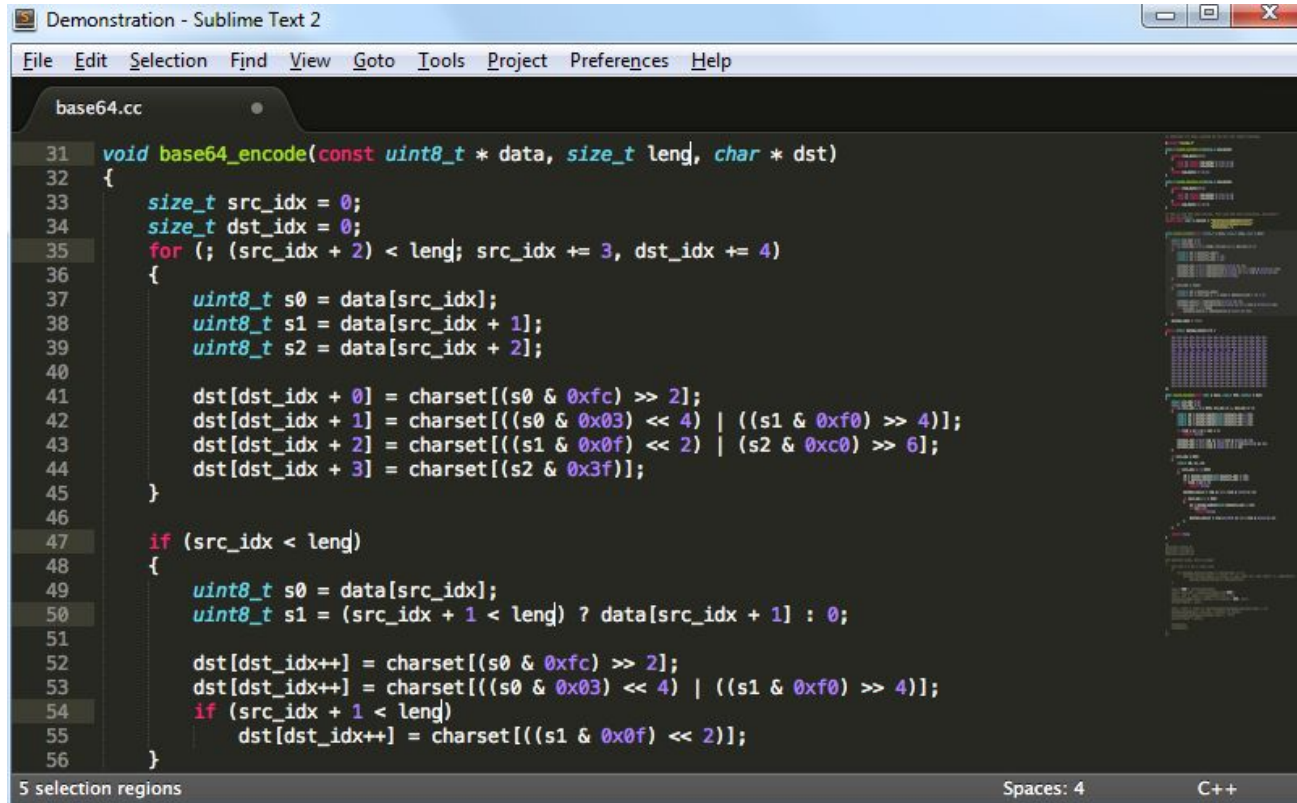


Cloud9 IDE

Your code anywhere, anytime

<https://c9.io>

Sublime Text



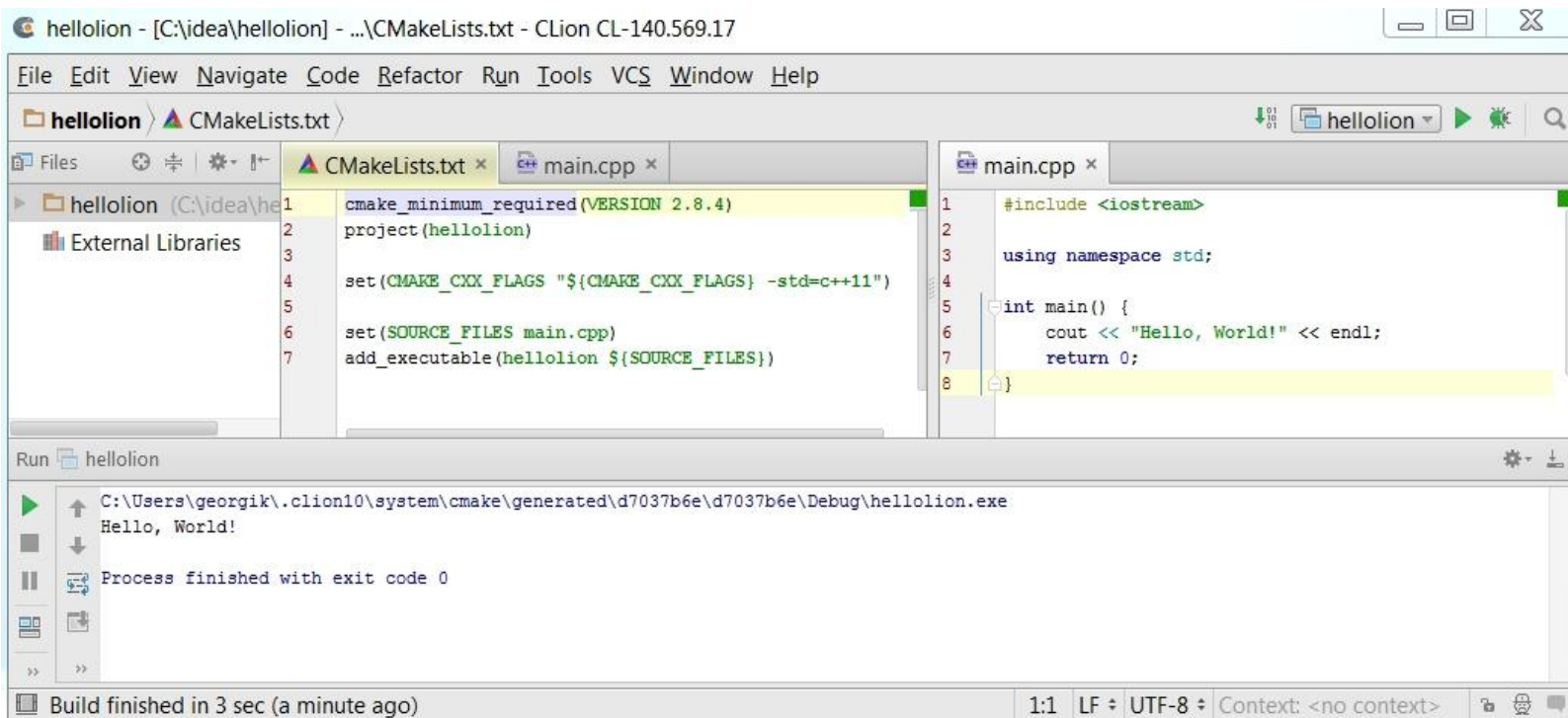
```
Demonstration - Sublime Text 2
File Edit Selection Find View Goto Tools Project Preferences Help

base64.cc
31 void base64_encode(const uint8_t * data, size_t leng, char * dst)
32 {
33     size_t src_idx = 0;
34     size_t dst_idx = 0;
35     for (; (src_idx + 2) < leng; src_idx += 3, dst_idx += 4)
36     {
37         uint8_t s0 = data[src_idx];
38         uint8_t s1 = data[src_idx + 1];
39         uint8_t s2 = data[src_idx + 2];
40
41         dst[dst_idx + 0] = charset[(s0 & 0xfc) >> 2];
42         dst[dst_idx + 1] = charset[((s0 & 0x03) << 4) | ((s1 & 0xf0) >> 4)];
43         dst[dst_idx + 2] = charset[((s1 & 0x0f) << 2) | (s2 & 0xc0) >> 6];
44         dst[dst_idx + 3] = charset[(s2 & 0x3f)];
45     }
46
47     if (src_idx < leng)
48     {
49         uint8_t s0 = data[src_idx];
50         uint8_t s1 = (src_idx + 1 < leng) ? data[src_idx + 1] : 0;
51
52         dst[dst_idx++] = charset[(s0 & 0xfc) >> 2];
53         dst[dst_idx++] = charset[((s0 & 0x03) << 4) | ((s1 & 0xf0) >> 4)];
54         if (src_idx + 1 < leng)
55             dst[dst_idx++] = charset[((s1 & 0x0f) << 2)];
56     }
57 }
```

5 selection regions Spaces: 4 C++



CLion



Older talks

<http://georgik.sinusgear.com/prednasky/>

YSofters

Twitter: [@ysoftdevs](https://twitter.com/ysoftdevs)

GitHub: github.com/ysoftdevs

Blog: www.ysofters.com

Technology Hour: www.meetup.com/ysoft-th