

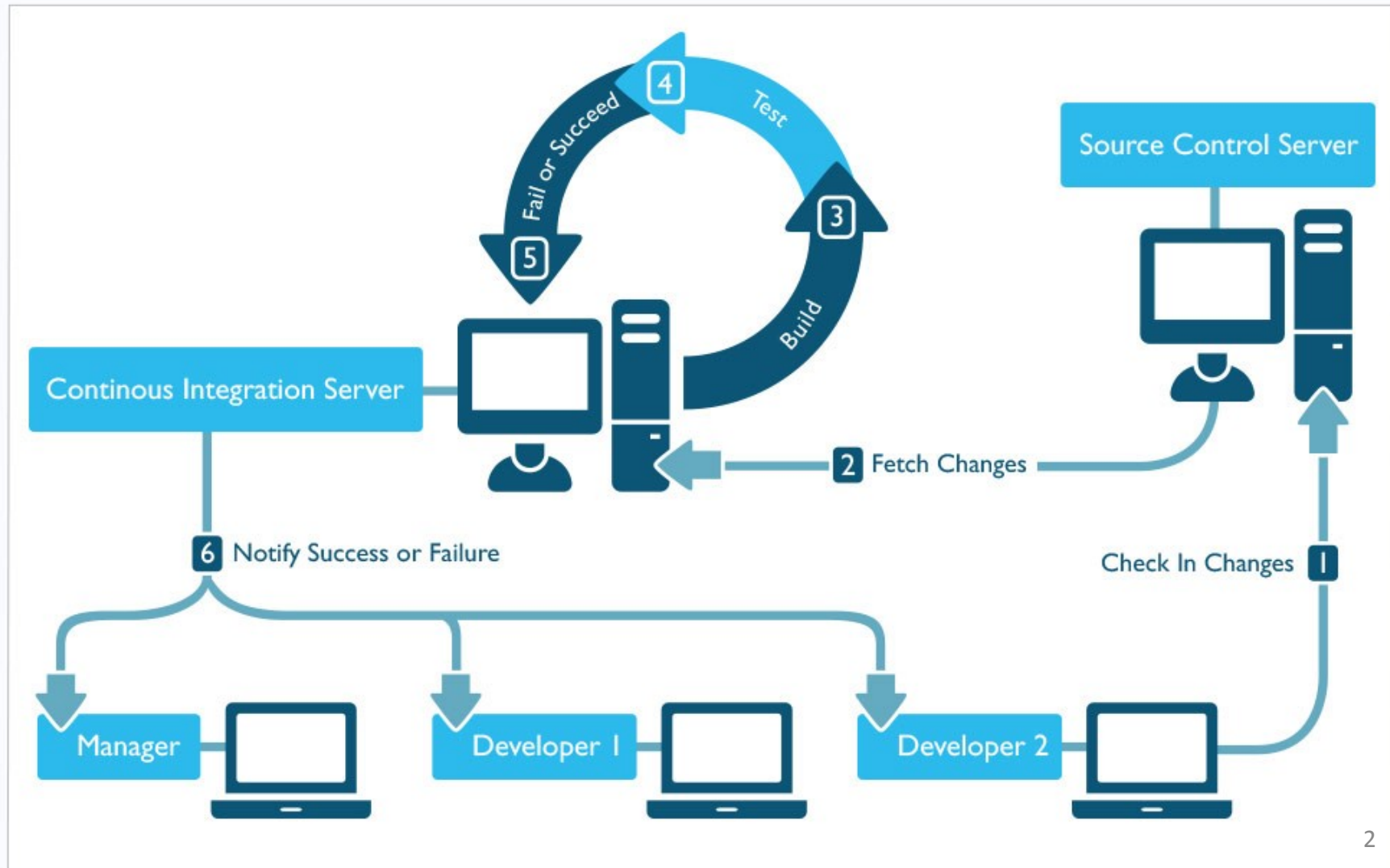
To test – continuously – or not to code

The survival practice
for any software developer

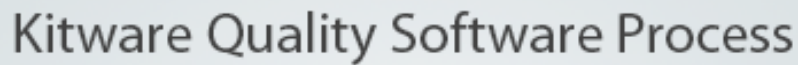
Claire Mouton
ENVOL 2016



When ?

Continuous integration



How?



Logos:   Wednesday, June 10 2009 10:58 AM EDT

CMAA Dashboard

Dashboard | Calendar | Previous | Current | Next | Project

32,363,324,925,374 4 authors as of 2009-06-10 21:00:00 EDT RSS

Style

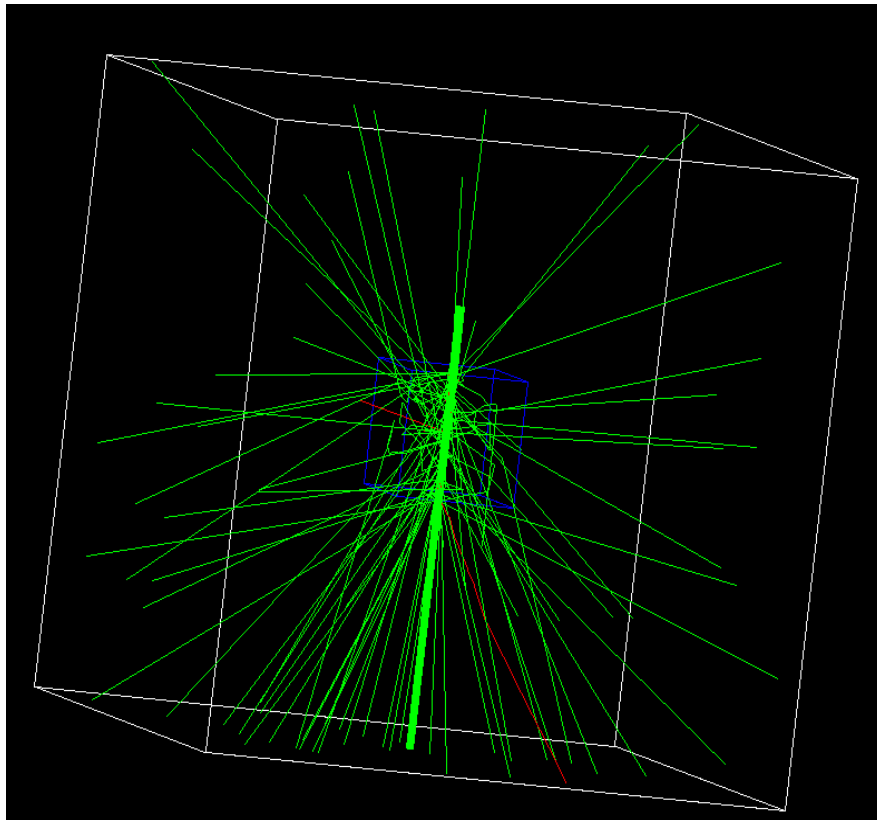
Site	Build Name	Update	Qty	Build			Test				Build Time
				Error	Warn	Mis	Nulltest	Fail	Pass	Mis	
evolve.vancouver	evolve 2.0	26	0	0	0	0	0	0	0	0	2009-06-10 02:11:00 EDT

Nightly Expected

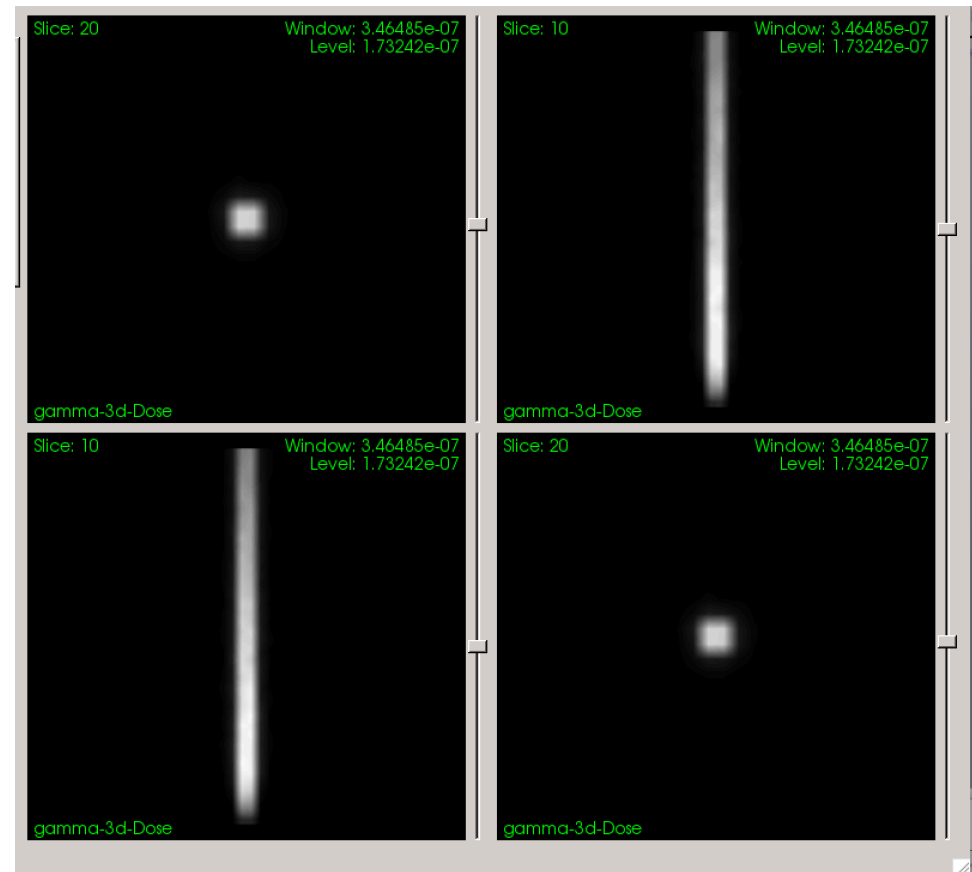
Site	Build Name	Update	Qty	Build			Test				Build Time
				Error	Warn	Mis	Nulltest	Fail	Pass	Mis	
www.cmaa.net/1.0	www.cmaa 2.0	26	0	0	0	0	0	0	36	10.6	2009-06-10 01:05:00 EDT
2009-06-10-01-05-00	2009-06-10-01-05-00	26	0	0	0	0	0	0	36	4.5	2009-06-10 00:01:00 EDT
2009-06-10-01-05-00	2009-06-10-01-05-00	26	0	0	0	0	0	0	36	27.5	2009-06-10 00:04:00 EDT
2009-06-10-01-05-00	2009-06-10-01-05-00	26	0	0	0	0	0	0	36	72.8	2009-06-10 00:02:00 EDT
2009-06-10-01-05-00	2009-06-10-01-05-00	26	0	0	0	0	0	0	36	32.8	2009-06-10 00:03:00 EDT
2009-06-10-01-05-00	2009-06-10-01-05-00	26	0	0	0	0	0	0	36	11.3	2009-06-10 00:01:00 EDT
2009-06-10-01-05-00	2009-06-10-01-05-00	26	0	0	0	0	0	0	36	10.2	2009-06-10 00:02:00 EDT
2009-06-10-01-05-00	2009-06-10-01-05-00	26	0	0	0	0	0	0	36	11.6	2009-06-10 01:05:00 EDT
2009-06-10-01-05-00	2009-06-10-01-05-00	26	0	0	0	0	0	0	36	11.6	2009-06-10 01:05:00 EDT
2009-06-10-01-05-00	2009-06-10-01-05-00	26	0	0	0	0	0	0	36	10.5	2009-06-10 00:03:00 EDT

How?

Proof by example



gamma beam in waterbox.



gamma-3d-Dose visualization with vv.

How?

Proof by example

Gate dashboard overview

The screenshot shows the CDash - GATE dashboard in a web browser. The browser address bar shows `my.cdash.org/index.php?project=GATE`. The dashboard header includes navigation links: Login, All Dashboards, Plans & Pricing, Support. The main header features the GATE logo and tabs: Dashboard, Calendar, Previous, Current, Project. The current date and time are Wednesday, March 23 2016 17:22:20 EDT.

Below the header, a message states: "No file changed as of Wednesday, March 23 2016 - 01:00 EDT". A list of recent events is shown:

- 6 hours ago: 3 tests failed on macosx64-gcc_4.2.1-geant4_10.01.p02-opengate-creatis-develop
- 6 hours ago: 1 warning introduced on macosx64-gcc_4.2.1-geant4_10.01.p02-opengate-creatis-develop
- 7 hours ago: 3 tests failed on macosx64-gcc_4.2.1-geant4_10.01.p02-opengate-creatis-develop
- 7 hours ago: 50 warnings introduced on macosx64-gcc_4.2.1-geant4_10.01.p02-opengate-creatis-develop
- 7 hours ago: 30 errors introduced on macosx64-gcc_4.2.1-geant4_10.01.p02-opengate-creatis-develop

A link "See full feed" is available.

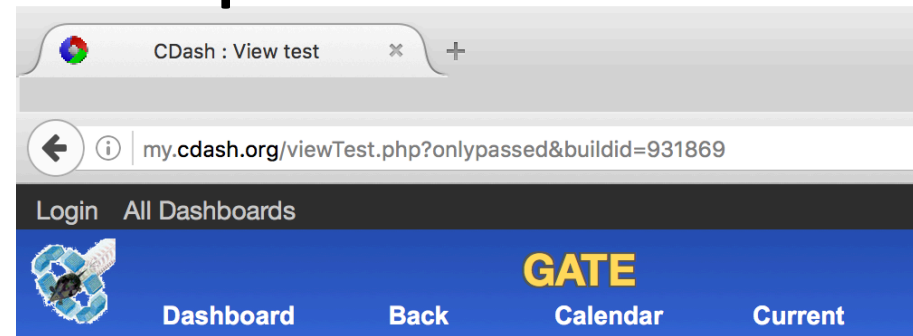
The "Nightly" section displays a table of build results:

Site	Build Name	Update		Configure			Build			Test			Build Time		
		Files	Time	Error	Warn	Time	Error	Warn	Time	Not Run	Fail	Pass		Time	
linux15.dg.creatis.insa-lyon.fr	linux-gcc_4.8.3-geant4_10.02-opengate-creatis-hybrid_cuda	0		0s	0	0	0s	40	32	4m 12s	0	0	0	0s	15 hours ago
macosx64.inserm.toulouse.fr	macosx64-gcc_4.2.1-geant4_10.01.p02-opengate-creatis-develop	0		0s	0	0	0s	0 ₋₆₀	1 ₋₄₉	3m 24s	0	3	0	0s	6 hours ago
latim.univ-brest.fr	linux-gcc_4.7.2-geant4_10.01-Gate-develop_gpu	0		0s	0	0	0s	0	14	1m 54s	0	0	0	0s	15 hours ago
linux15.dg.creatis.insa-lyon.fr	linux-gcc_4.8.3-geant4_10.02-Gate-develop	0		0s	0	0	0s	0	0	3m 24s	0	0	3	18s	15 hours ago
linux15.dg.creatis.insa-lyon.fr	linux-gcc_4.8.3-geant4_10.02-Gate-develop_c++11	0		0s	0	0	0s	0	0	3m 18s	0	0	3	18s	15 hours ago
linux15.dg.creatis.insa-lyon.fr	linux-gcc_4.8.3-geant4_10.02-QtON-opengate-creatis-develop	0		0s	0	0	0s	0	0	3m 30s	0	0	3	24s	15 hours ago
linux15.dg.creatis.insa-lyon.fr	linux-gcc_4.8.3-geant4_10.02-opengate-creatis-develop	0		0s	0	0	0s	0	0	3m 24s	0	0	3	18s	15 hours ago

How?

Proof by example

Results of the tests



Testing started on 2016-03-23 06:05:48

Site Name:linux15.dg.creatis.insa-lyon.fr

Build Name:linux-gcc_4.8.3-geant4_10.02-Gate-develop

Total time:23s 60ms

OS Name:Linux

OS Platform:x86_64

OS Release:4.4.5-200.fc22.x86_64

OS Version:#1 SMP Thu Mar 10 17:54:17 UTC 2016

Compiler Version:unknown

3 tests passed.

Name	Status	Time	Summary
benchRT_carbon	Passed	6s 340ms	Stable
benchRT_proton	Passed	1s 270ms	Stable
benchRT_gamma	Passed	15s 450ms	Stable

[Download Table as CSV File](#)

How?

Proof by example

Example of a log (1/2)

CDash : GATE

my.cdash.org/testDetails.php?test=23997931&build=931869

Login All Dashboards Plans & Pricing Support

GATE

Dashboard Back Calendar Previous Current Project

Test: benchRT_carbon (Passed)

Build: linux-gcc_4.8.3-geant4_10.02-Gate-develop (linux15.dg.creatis.insa-lyon.fr) on 2016-03-23 02:02:24

Repository revision: 3d7e6aaebb4a170d100632833505260e7f78c67d

Test Details: Completed

Show Command Line

Display graphs: Select...

Test output

CTEST_FULL_OUTPUT

Current directory:
/tmp/dashboard_2016-03-23_07-01-03/Gate-develop-bin-10.02/benchmarks

Printing the three parameters for debugging:
benchRT
carbon
/tmp/dashboard_2016-03-23_07-01-03/Gate-develop

Gate binary location:
GATE_BINARY is set to '/tmp/dashboard_2016-03-23_07-01-03/Gate-develop-bin-10.02/Gate'

This test is launched from 'make test' or for the Nightly dashboard.
Benchmarks directory:
/tmp/dashboard_2016-03-23_07-01-03/Gate-develop/benchmarks

Working directory:
/tmp/dashboard_2016-03-23_07-01-03/Gate-develop/benchmarks/benchRT

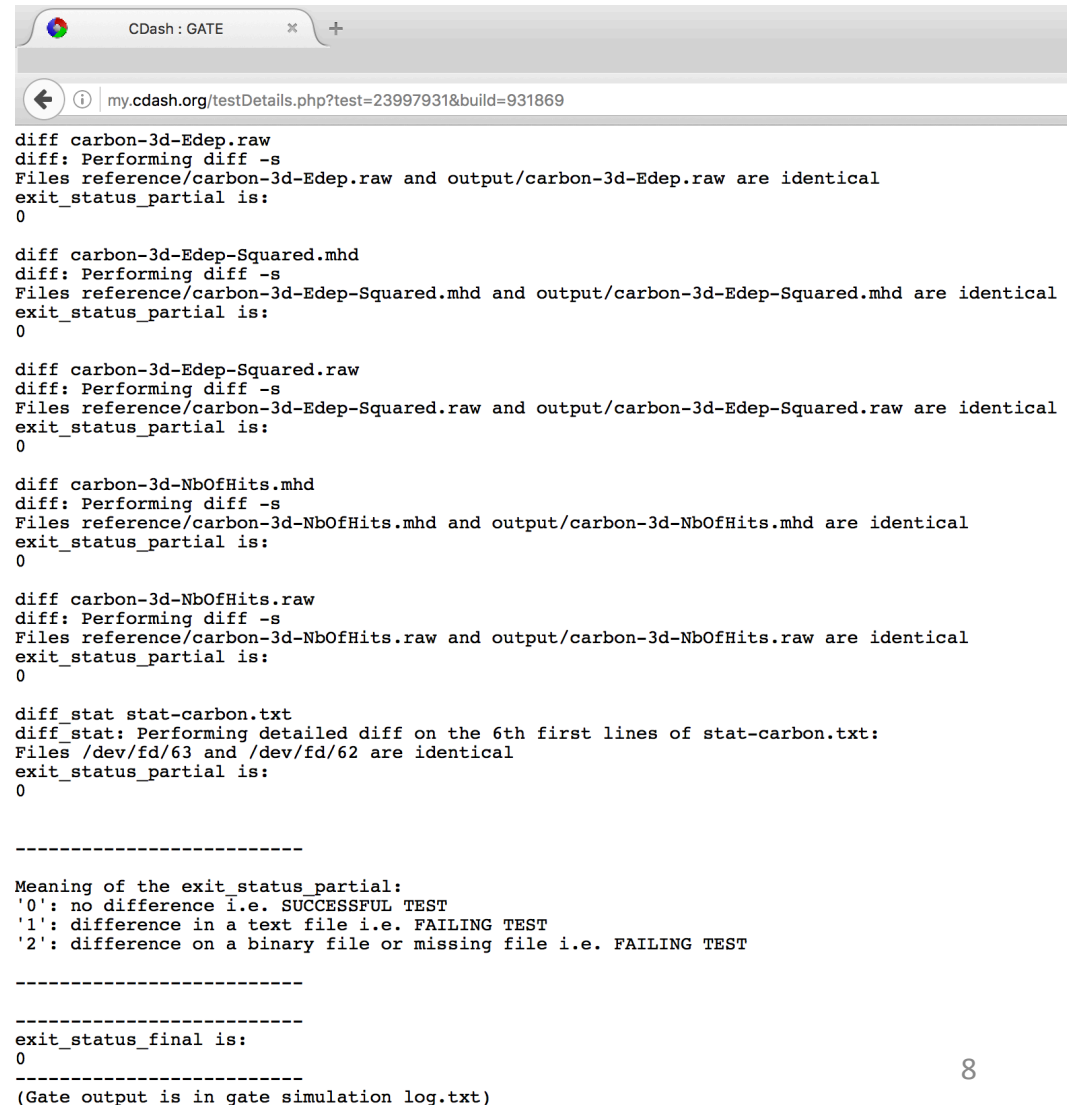
Launching Gate binary on mac/carbon.mac.
Gate binary has finished.
See at the end of this report for the generated output.

Reference archive content:
benchRT_carbon_ref.txt
benchRT_carbon.txt

How?

Proof by example

Example of a log (1/2)



```
diff carbon-3d-Edep.raw
diff: Performing diff -s
Files reference/carbon-3d-Edep.raw and output/carbon-3d-Edep.raw are identical
exit_status_partial is:
0

diff carbon-3d-Edep-Squared.mhd
diff: Performing diff -s
Files reference/carbon-3d-Edep-Squared.mhd and output/carbon-3d-Edep-Squared.mhd are identical
exit_status_partial is:
0

diff carbon-3d-Edep-Squared.raw
diff: Performing diff -s
Files reference/carbon-3d-Edep-Squared.raw and output/carbon-3d-Edep-Squared.raw are identical
exit_status_partial is:
0

diff carbon-3d-NbOfHits.mhd
diff: Performing diff -s
Files reference/carbon-3d-NbOfHits.mhd and output/carbon-3d-NbOfHits.mhd are identical
exit_status_partial is:
0

diff carbon-3d-NbOfHits.raw
diff: Performing diff -s
Files reference/carbon-3d-NbOfHits.raw and output/carbon-3d-NbOfHits.raw are identical
exit_status_partial is:
0

diff_stat stat-carbon.txt
diff_stat: Performing detailed diff on the 6th first lines of stat-carbon.txt:
Files /dev/fd/63 and /dev/fd/62 are identical
exit_status_partial is:
0

-----

Meaning of the exit status partial:
'0': no difference i.e. SUCCESSFUL TEST
'1': difference in a text file i.e. FAILING TEST
'2': difference on a binary file or missing file i.e. FAILING TEST

-----

exit_status_final is:
0

-----

(Gate output is in gate_simulation_log.txt)
```

Summary

Testing is a **survival practice** in any source code development life cycle.

- Test as **early** as possible.
- You can even **start by testing!**
- Test as **often** as possible.

CDash is your nightly friend!

Conclusion

What software would we get
without any test ?

Conclusion

What software would we get
without any test ?

Your software would live its own odd life...

Richard's guide to software development

