



AUTOMATED TESTING: PAST, PRESENT AND FUTURE

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GOALS



-
- NetBSD is where testing is happening
 - Show what's coming in the near future

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- NetBSD is where testing is happening
 - Show what's coming in the near future

 - Get other BSD systems involved!

CONTENTS



Past

What led to ATF?

Present

What is ATF?

Other testing technologies

Future

A critique of ATF

Meet Kyua

WHY TESTING?



- Software has bugs
- Automated testing helps reducing bugs

ORIGINS: SRC/REGRESS



- No consistency
- Not used; instead, ad-hoc testing
- What about release engineering?

WHAT IS ATF?



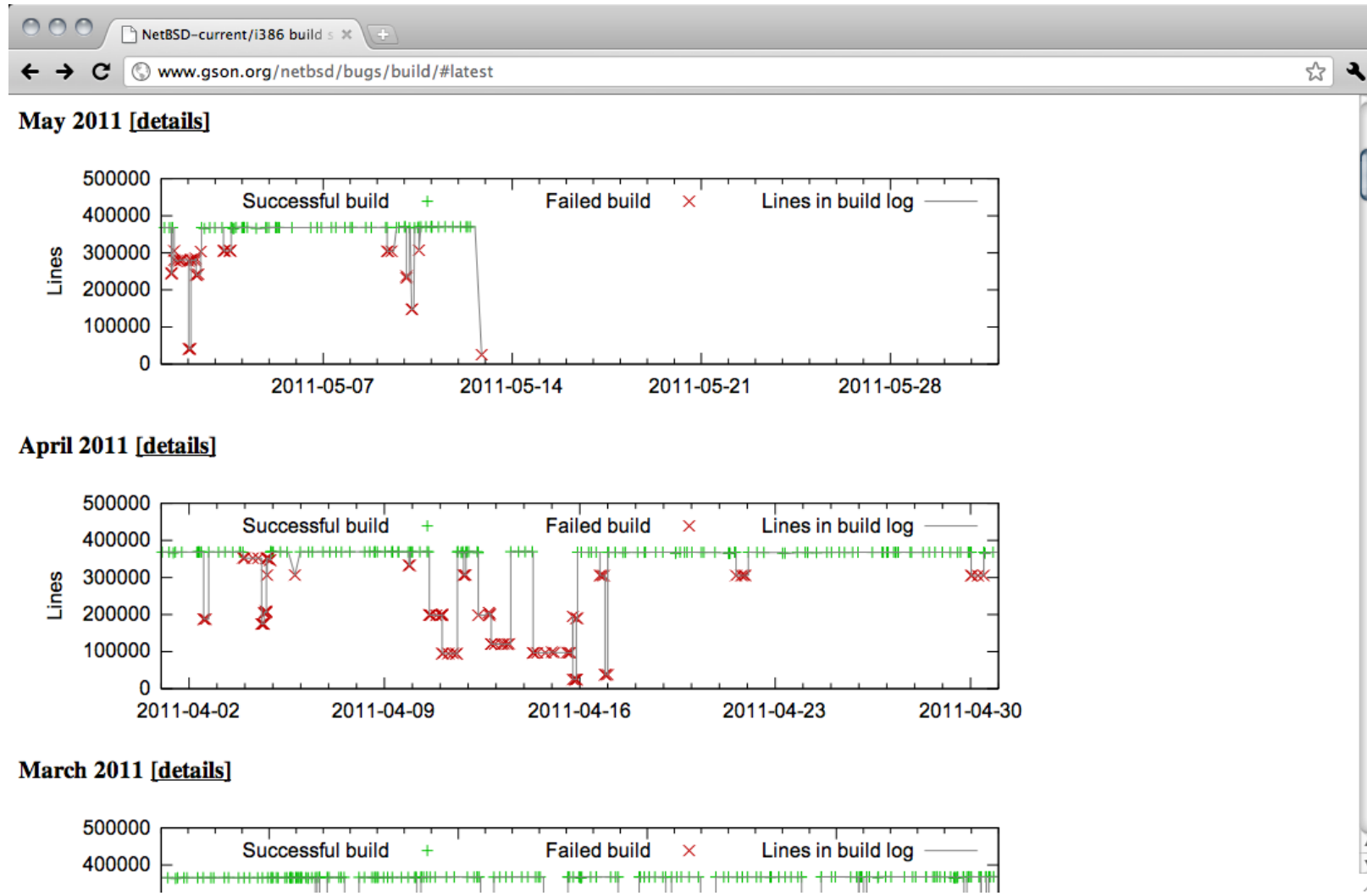
- Simply put: a testing framework
 - Libraries: C, C++, Shell
 - Tools: run, report
- Since 2007 (SoC) until now

- For developers:
 - Maintain stable current
 - Help release engineering
- For users:
 - Confidence

- rump
- puffs, pud and others
- anita

- Development policies
- Dashboards

CONTINUOUS BUILDS



CONTINUOUS BUILDS



```
2011.04
www.gson.org/netbsd/bugs/build/commits-2011.04.html#end
commit 2011.04.04.20.37.56 dyoung src/sys/dev/pci/pciivar.h 1.92
commit 2011.04.04.20.37.56 dyoung src/sys/dev/pci/pdcide.c 1.29
commit 2011.04.04.20.37.56 dyoung src/sys/dev/pci/pdcsata.c 1.20
commit 2011.04.04.20.37.56 dyoung src/sys/dev/pci/piixide.c 1.57
commit 2011.04.04.20.37.56 dyoung src/sys/dev/pci/rccide.c 1.21
commit 2011.04.04.20.37.56 dyoung src/sys/dev/pci/satalink.c 1.43
commit 2011.04.04.20.37.56 dyoung src/sys/dev/pci/schide.c 1.2
commit 2011.04.04.20.37.56 dyoung src/sys/dev/pci/siside.c 1.27
commit 2011.04.04.20.37.56 dyoung src/sys/dev/pci/slide.c 1.22
commit 2011.04.04.20.37.56 dyoung src/sys/dev/pci/stpcide.c 1.21
commit 2011.04.04.20.37.56 dyoung src/sys/dev/pci/svwsata.c 1.13
commit 2011.04.04.20.37.56 dyoung src/sys/dev/pci/toshide.c 1.4
commit 2011.04.04.20.37.56 dyoung src/sys/dev/pci/viaide.c 1.72
commit 2011.04.04.20.37.57 dyoung src/sys/external/bsd/drm/dist/bsd-core/mga\_drv.c 1.8
commit 2011.04.04.21.33.49 dyoung src/sys/arch/x86/conf/files.x86 1.66
build: failed with 346516 lines of log
commit 2011.04.04.21.35.31 dyoung src/sys/arch/amd64/conf/files.amd64 1.71
commit 2011.04.04.21.46.15 ahoka src/sys/ufs/ufs/ufs\_extern.h 1.64
build: failed with 346363 lines of log
commit 2011.04.04.22.13.58 dyoung src/sys/dev/pci/rdcide.c 1.2
build: OK with 368781 lines of log, install: OK, boot: OK, tests: did not complete
commit 2011.04.04.22.15.13 macallan src/sys/arch/sqimips/dev/files.dev 1.11
build: OK with 368738 lines of log, install: OK, boot: OK, tests: did not complete
commit 2011.04.04.22.33.32 dyoung src/gnu/dist/gdb6/sim/ppc/emul\_netbsd.c 1.7
build: OK with 368765 lines of log, install: OK, boot: OK, tests: 2086 passed, 63 skipped, 53 expected failure, 1 failed, ATF
output: raw, xml, html
commit 2011.04.04.22.48.15 dyoung src/sys/dev/pci/ehci\_pci.c 1.52
commit 2011.04.04.22.48.15 dyoung src/sys/dev/pci/ohci\_pci.c 1.47
commit 2011.04.04.22.48.15 dyoung src/sys/dev/pci/uhci\_pci.c 1.53
build: OK with 368929 lines of log, install: OK, boot: OK, tests: 2087 passed, 63 skipped, 53 expected failure, 0 failed, ATF
output: raw, xml, html
commit 2011.04.04.22.50.36 macallan src/sys/arch/sqimips/dev/crmfb.c 1.31
commit 2011.04.05.00.27.35 yamt src/sys/kern/kern\_time.c 1.167
build: OK with 368864 lines of log, install: OK, boot: OK, tests: 2087 passed, 63 skipped, 53 expected failure, 0 failed, ATF
output: raw, xml, html
commit 2011.04.05.02.52.27 enami src/etc/rc.d/ccd 1.7
commit 2011.04.05.06.15.30 jruoho src/distrib/sets/lists/tests/mi 1.292
commit 2011.04.05.06.15.30 jruoho src/tests/lib/libc/stdlib/Makefile 1.10
commit 2011.04.05.06.15.30 jruoho src/tests/lib/libc/stdlib/t\_strtod.c 1.1
commit 2011.04.05.06.15.31 jruoho src/tests/lib/libc/gen/Makefile 1.17
commit 2011.04.05.06.15.31 jruoho src/tests/lib/libc/gen/t\_getqrent.c 1.1
commit 2011.04.05.06.15.31 jruoho src/tests/lib/libc/gen/t\_ttyname.c 1.1
commit 2011.04.05.06.24.42 aac src/external/bsd/liblzf/dist/lzf.c.c 1.3
```

RELENG DASHBOARD



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Test Run Logs

Disclaimer: The logs are provided by individuals and are not an official service of The NetBSD Project. Frequencies are approximate and subject to the availability of the people running the tests.

Port/version	NetBSD login	Main page	Latest Results	Frequency	Platform	Comments
alpha/-current	njoly	link	Test log	manual	Digital PWS500au	
amd64/-current	pgoyette	link	Test log	daily	QEMU/Anita	QEMU clock is not accurate and causes sporadic failures in some tests
amd64/-current	jun	link	see page	biweekly	Thinkpad X61	
hpcarm/-current	jun	link	see page	biweekly	WZero3/WS011SH	
hpcmips/-current	jun	link	see page	biweekly	sigmarion	
hpcsh/-current	jun	link	see page	biweekly	HP Jornada 680	
i386/-current	gson	link	top of page	daily	QEMU/Anita	
macppc/-current	riz	link	Test log	Manually	Power Mac G4/400	pthread mutex problems and sporadic failures in tests using them
sparc64/-current	martin	link	Test log	weekly	Sun Blade 1000 (USIII+)	

This page is maintained by pooka@NetBSD.org. Send email if you have regularly updated build/test results you wish to share.

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A CRITIQUE OF ATF



- Ugly codebase
- Desired features are hard to implement
 - Parallel execution
 - Integrated dashboards
- High entry barrier for contributors

REFACTOR VS. REWRITE



- The eternal dilemma

REFACTOR VS. REWRITE



- The eternal dilemma
- Decision:
 - Rewrite user tools
 - Reuse bindings (atf-`{c,c++,sh}`) for now

WHAT IS KYUA?



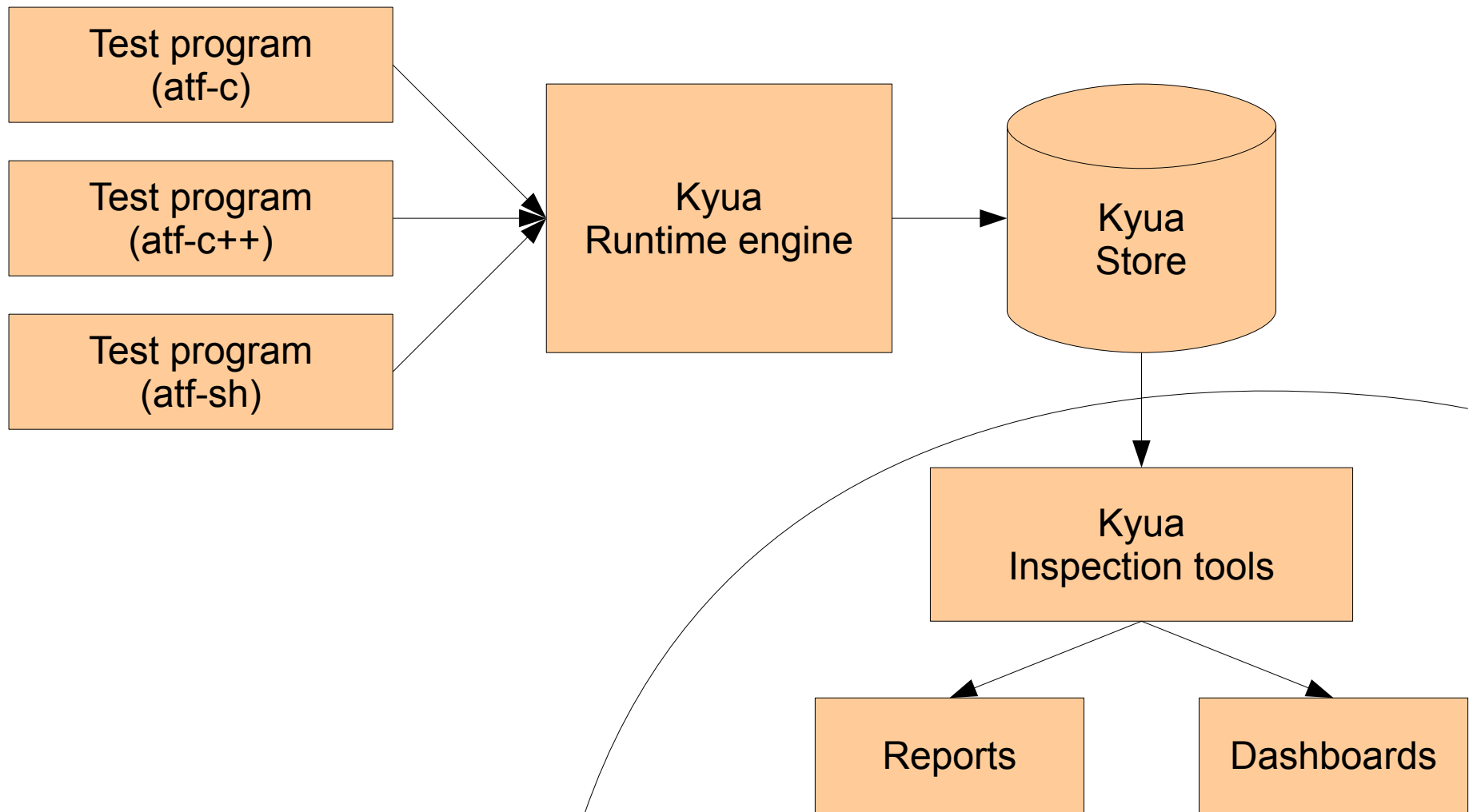
- *Think of it as ATF v2*
- Component separation
- “Better” code
- Easier entry for contributors
- New features!

FROM ATF TO KYUA



- Smooth migration plan
- Rewrite the tools (easy!)
- Later: rewrite the libraries (hard)

KYUA: COMPONENTS



KYUA: EASY ENTRY



<http://code.google.com/p/kyua/>

TEST COVERAGE



	Test cases	Run time
ATF All components	542	683
Kyua Runtime engine	48s real 19s user 16s sys	23s real 4s user 5s sys

KYUA EXAMPLES



```
$ cd /usr/tests
```

```
$ kyua test --session_id=bsdcan_session
```

```
$ kyua debug fs/tmpfs/t_mount
```

```
$ kyua inspect fs/tmpfs/t_mount
```

```
$ kyua export --session_id=bsdcan_session  
-o html
```

- Kyua 0.1: run-time engine, no store
- Kyua 0.2: with store, exporting of results

- Lua binding for test programs?
- Adoption by other BSDs?

CONCLUSIONS



- Tests make NetBSD more robust
- NetBSD has many exciting technologies
- Kyua is the evolution of ATF

- Other BSDs should join the party!

Kyua

<http://code.google.com/p/kyua/>
<kyua-discuss@googlegroups.com>

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