Software Model Checking and Debian - better together

Michael Tautschnig (mt)

Introducing myself as this is my first Debian (Mini-)conf

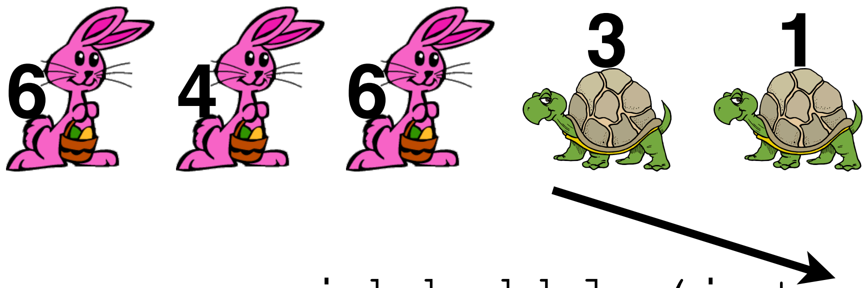
- DD since 05/12/2007
- Packages (co-)maintained mainly relate to my academic activities: BrickOS & friends (Lego Mindstorms), SAT solvers, CBMC, and some others
- When time permitted: debian-mentors/sponsorship
- Main interests: software quality and automation
  - Passion for quality is main driver of this work

Writing correct code is easy: Bubble Sort

```
void bubble(int a[], int N) {
  int i, j, t;

  for (i = N; i >= 0; i--) {
    for (j = 2; j <= 1; j++) {
      if (a[j - 1] > a[j]) {
        t = a[j - 1];
        a[j - 1] = a[j];
        a[j] = t;
      }
    }
  }
}
```

Writing correct code is easy: Bubble Sort



```
void bubble(int a[], int N) {
  int i, j, t;

  for (i = N; i >= 0; i--) {
    for (j = 2; j <= 1; j++) {
      if (a[j - 1] > a[j]) {
        t = a[j - 1];
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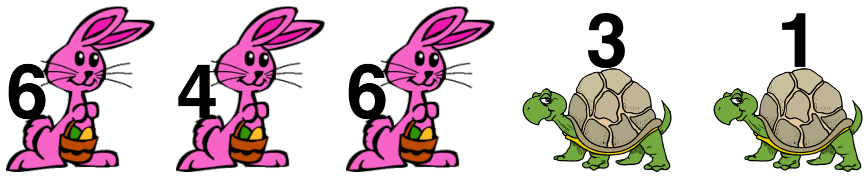
Writing correct code is easy: Bubble Sort



N=5

```
void bubble(int a[], int N) {
  int i, j, t;

  for (i = N; i >= 0; i--) {
    for (j = 2; j <= 1; j++) {
      if (a[j - 1] > a[j]) {
        t = a[j - 1];
        a[j - 1] = a[j];
        a[j] = t;
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        t = a[j - 1];
        a[j - 1] = a[j];
        a[j] = t;
      }
    }
  }
}
```

Is the implementation correct?

```
void bubble(int a[], int N) {
  int i, j, t;

  for (i = N; i >= 0; i--) {
    for (j = 2; j <= 1; j++) {
      if (a[j - 1] > a[j]) {
        t = a[j - 1];
        a[j - 1] = a[j];
        a[j] = t;
      }
    }
  }
}
```

```
int main(int argc, char* argv[]) {
  int a[5];
  int i;

  printf("to sort:");
  for (i = 0; i < 5; ++i)
    printf(" %d", a[i]);
  printf("\n");

  bubble(a, 5);

  printf("sorted:");
  for (i = 0; i < 5; ++i)
    printf(" %d", a[i]);
  printf("\n");

  return 0;
}
```

Manual Testing

```
void bubble(int a[], int N) {
  int i, j, t;

  for (i = N; i >= 0; i--) {
    for (j = 2; j <= 1; j++) {
      if (a[j - 1] > a[j]) {
        t = a[j - 1];
        a[j - 1] = a[j];
        a[j] = t;
      }
    }
  }
}
```

```
int main(int argc, char* argv[]) {
  int a[5] = { 1, 5, 3, 5, 2 };
  int i;

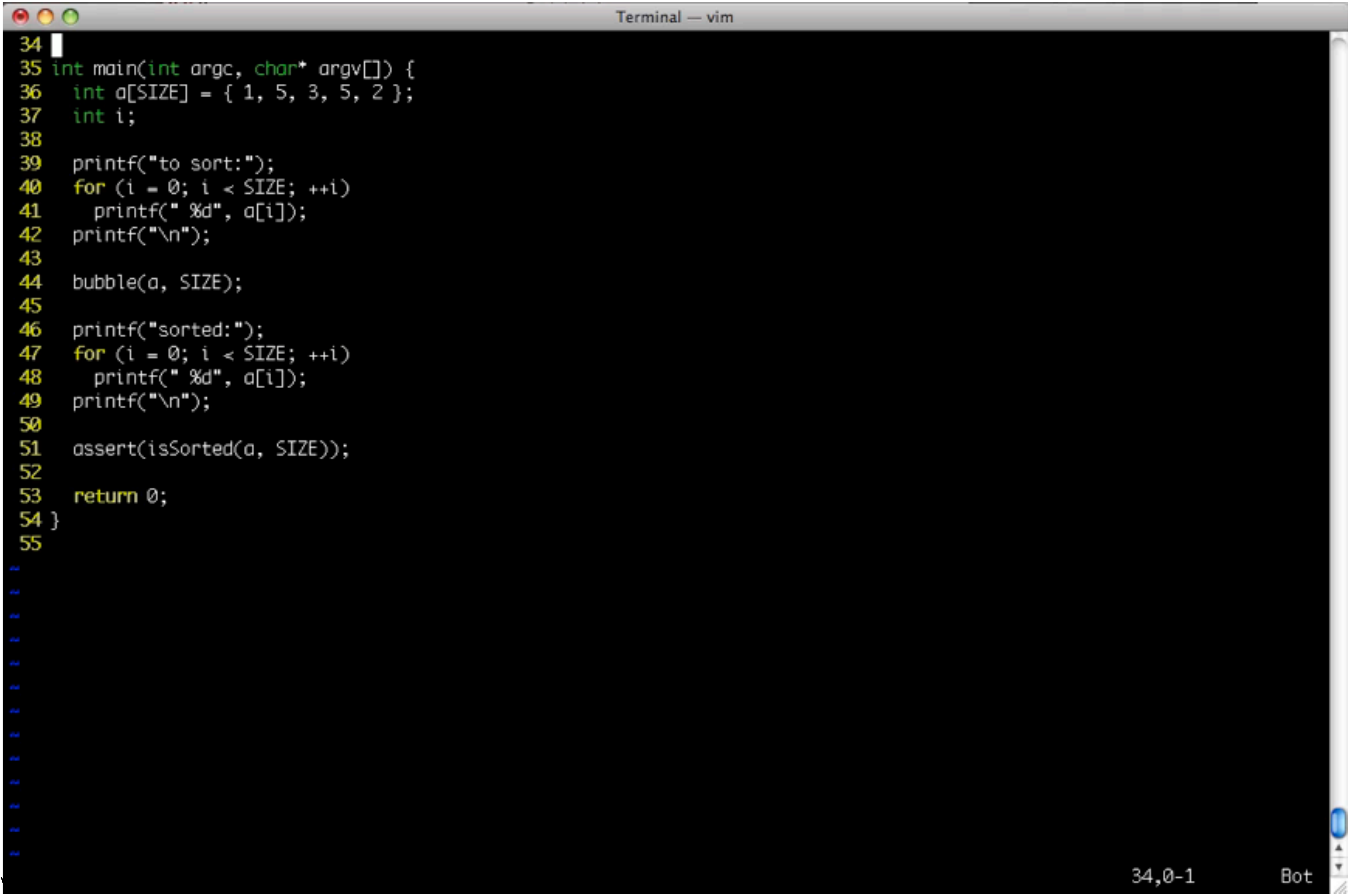
  printf("to sort:");
  for (i = 0; i < 5; ++i)
    printf(" %d", a[i]);
  printf("\n");

  bubble(a, 5);

  printf("sorted:");
  for (i = 0; i < 5; ++i)
    printf(" %d", a[i]);
  printf("\n");

  return 0;
}
```

Manual Testing



```

int main(int argc, char* argv[]) {
  int a[SIZE] = { 1, 5, 3, 5, 2 };
  int i;

  printf("to sort:");
  for (i = 0; i < SIZE; ++i)
    printf(" %d", a[i]);
  printf("\n");

  bubble(a, SIZE);

  printf("sorted:");
  for (i = 0; i < SIZE; ++i)
    printf(" %d", a[i]);
  printf("\n");

  assert(isSorted(a, SIZE));

  return 0;
}

```

Bubble Sort - Fixing one bug

```
void bubble(int a[], int N) {
  int i, j, t;

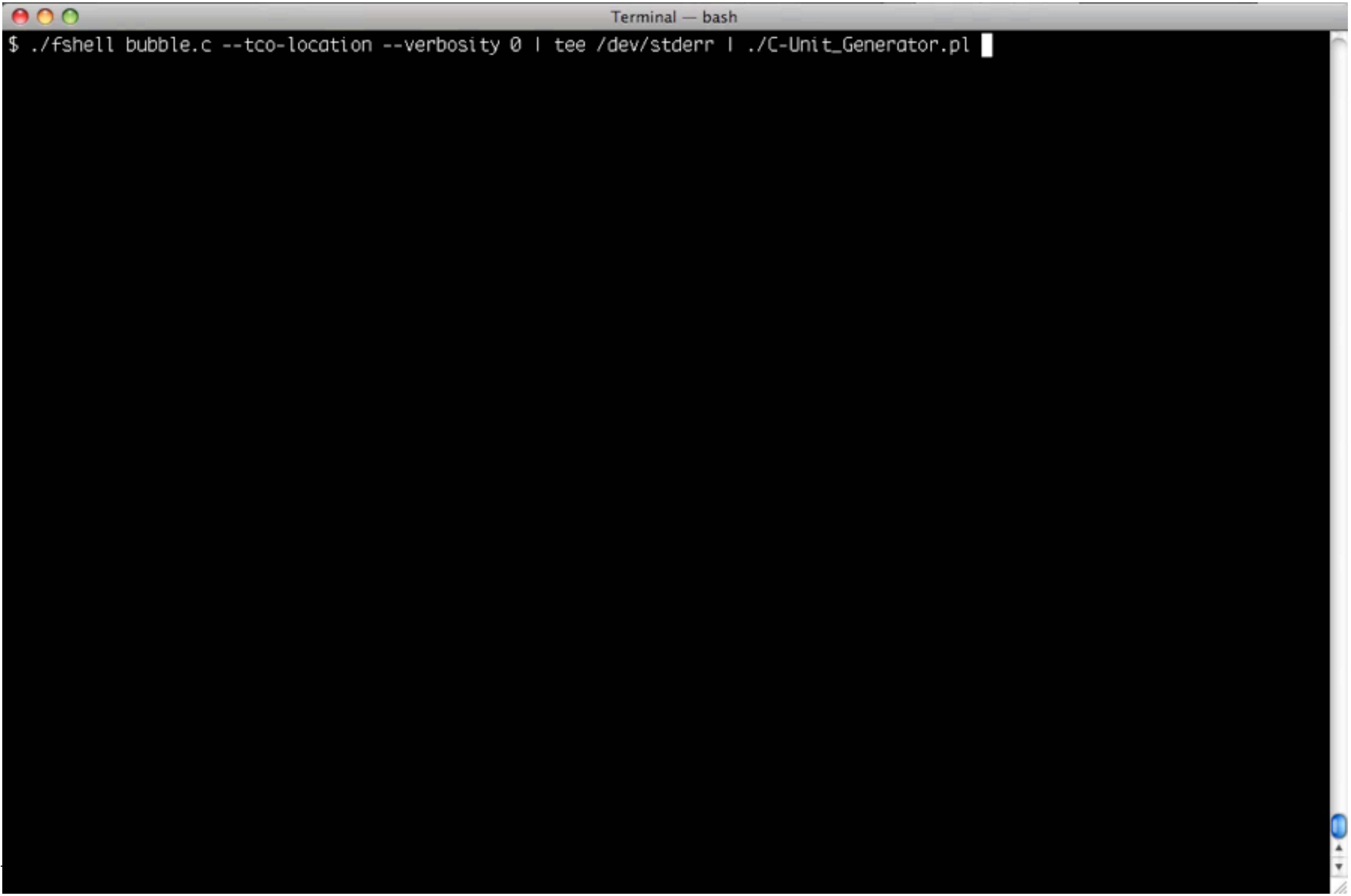
  for (i = N; i >= 0; i--) {
    for (j = 2; j <= 1; j++) {
      if (a[j - 1] > a[j]) {
        t = a[j - 1];
        a[j - 1] = a[j];
        a[j] = t;
      }
    }
  }
}
```

Bubble Sort - Fixing one bug

```
void bubble(int a[], int N) {
  int i, j, t;

  for (i = N; i >= 0; i--) {
    for (j = 2; j <= i  j++) {
      if (a[j - 1] > a[j]) {
        t = a[j - 1];
        a[j - 1] = a[j];
        a[j] = t;
      }
    }
  }
}
```

Automated Test-input Generation



```
$ ./fshell bubble.c --tco-location --verbosity 0 | tee /dev/stderr | ./C-Unit_Generator.pl
```

Bubble Sort - Another bug fixed

```
void bubble(int a[], int N) {
  int i, j, t;

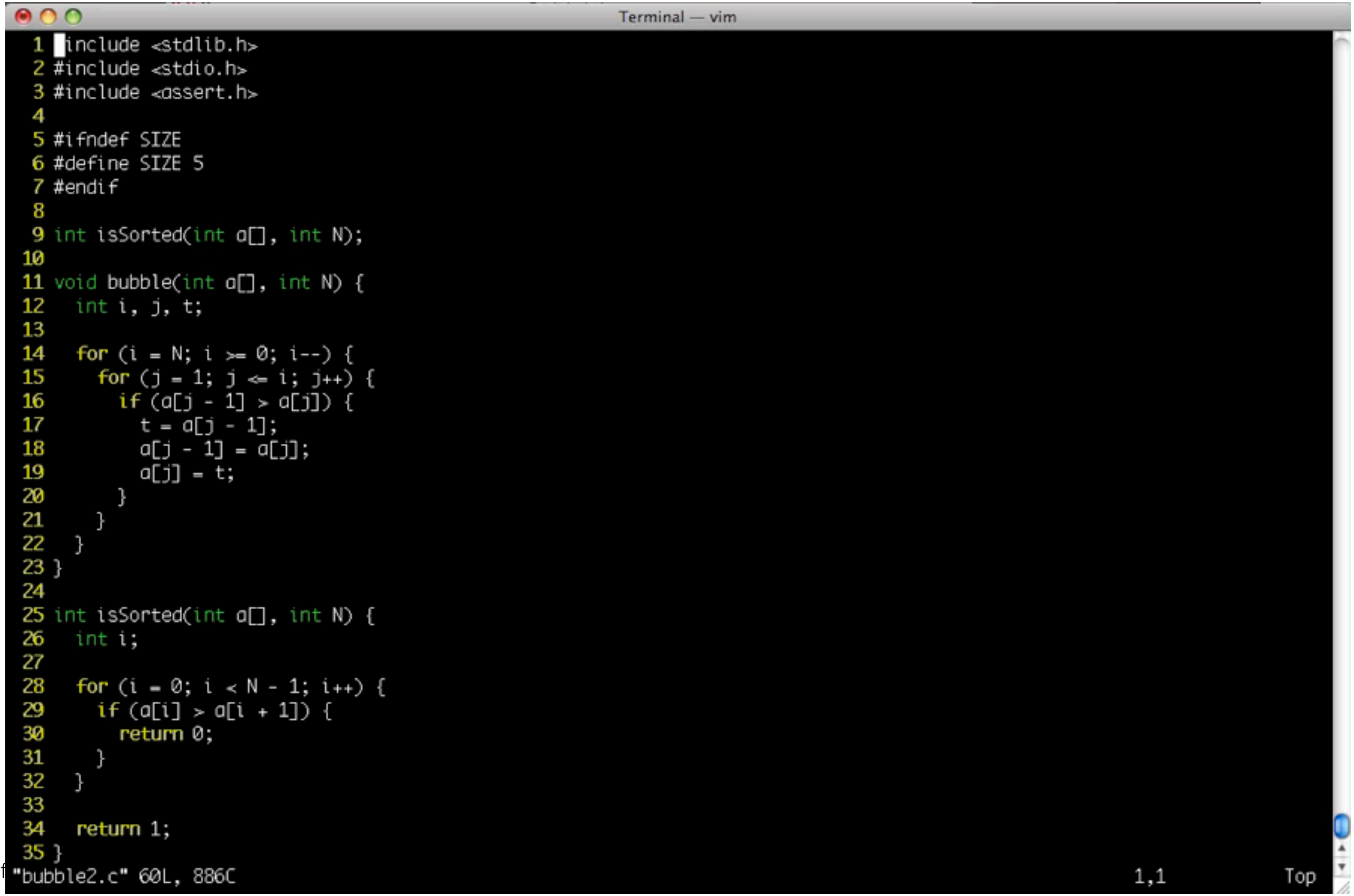
  for (i = N; i >= 0; i--) {
    for (j = 2; j <= i; j++) {
      if (a[j - 1] > a[j]) {
        t = a[j - 1];
        a[j - 1] = a[j];
        a[j] = t;
      }
    }
  }
}
```

Bubble Sort - Another bug fixed

```
void bubble(int a[], int N) {
  int i, j, t;

  for (i = N; i >= 0; i--) {
    for (j = 1; j <= i; j++) {
      if (a[j - 1] > a[j]) {
        t = a[j - 1];
        a[j - 1] = a[j];
        a[j] = t;
      }
    }
  }
}
```

Model Checking



```
#include <stdlib.h>
#include <stdio.h>
#include <assert.h>

#ifndef SIZE
#define SIZE 5
#endif

int isSorted(int a[], int N);

void bubble(int a[], int N) {
  int i, j, t;

  for (i = N; i >= 0; i--) {
    for (j = 1; j <= i; j++) {
      if (a[j - 1] > a[j]) {
        t = a[j - 1];
        a[j - 1] = a[j];
        a[j] = t;
      }
    }
  }
}

int isSorted(int a[], int N) {
  int i;

  for (i = 0; i < N - 1; i++) {
    if (a[i] > a[i + 1]) {
      return 0;
    }
  }

  return 1;
}
"bubble2.c" 60L, 886C                                        1,1          Top
```

When testing isn’t useful anymore ...

```
volatile unsigned x = 0, y = 0;
volatile unsigned r1 = 0, r2 = 0;

void* A(void* arg) {
  x = 1;
  r1 = y + 1;
}

void* B(void* arg) {
  y = 1;
  r2 = x + 1;
}

void main(){
  pthread_create(0, 0, A, 0);
  pthread_create(0, 0, B, 0);
  assert(!(r1 == 1 && r2 == 1));
}
```

When testing isn’t useful anymore ...

```
volatile unsigned x = 0, y = 0;
volatile unsigned r1 = 0, r2 = 0;

void* A(void* arg) {
  x = 1;
  r1 = y + 1;
}

void* B(void* arg) {
  y = 1;
  r2 = x + 1;
}

void main(){
  pthread_create(0, 0, A, 0);
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  assert(!(r1 == 1 && r2 == 1));
}
```

Assertion `!(r1 == 1 && r2 == 1)' failed.

When testing isn’t useful anymore ...

```
volatile unsigned x = 0, y = 0;
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void* A(void* arg) {
  x = 1;
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}

void* B(void* arg) {
  y = 1;
  r2 = x + 1;
}

void main() {
  pthread_create(0, 0, A, 0);
  pthread_create(0, 0, B, 0);
  assert(!(r1 == 1 && r2 == 1));
}
```

Assertion `!(r1 == 1 && r2 == 1)' failed.

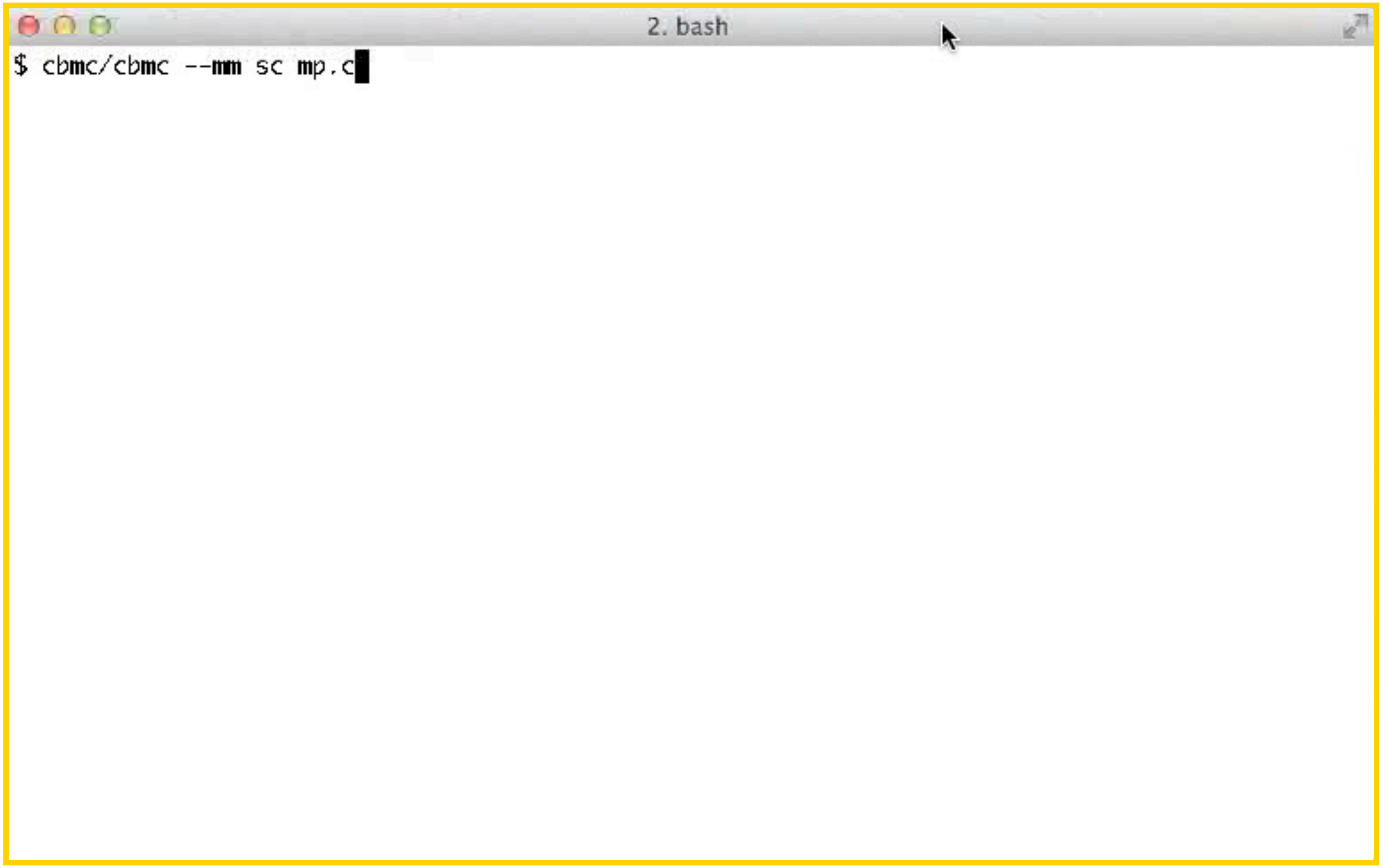
... in 0.1-10% of all test runs

What is Software Model Checking

- Fully automatic method
- May provide proofs of correctness
- Input:
  - Specification: `assert(x!=0);`
  - Model: source code
- Output:
  - “yes” (specification always holds)
  - “no” + counterexample (specification can be violated)

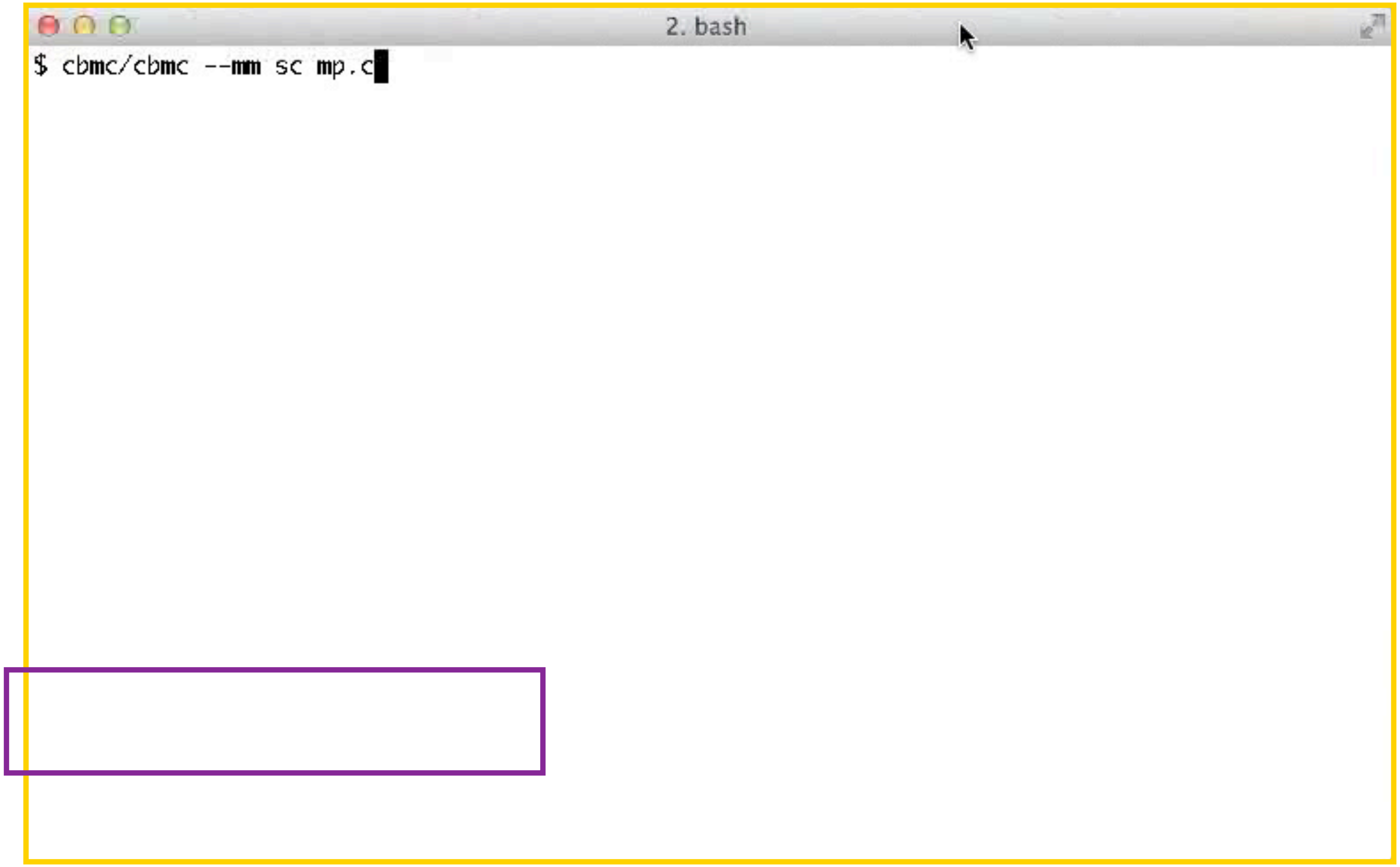
- Main academic problem: scalability
- Practical problem: **making tools work (on real code)**

Applying CBMC to this piece of code



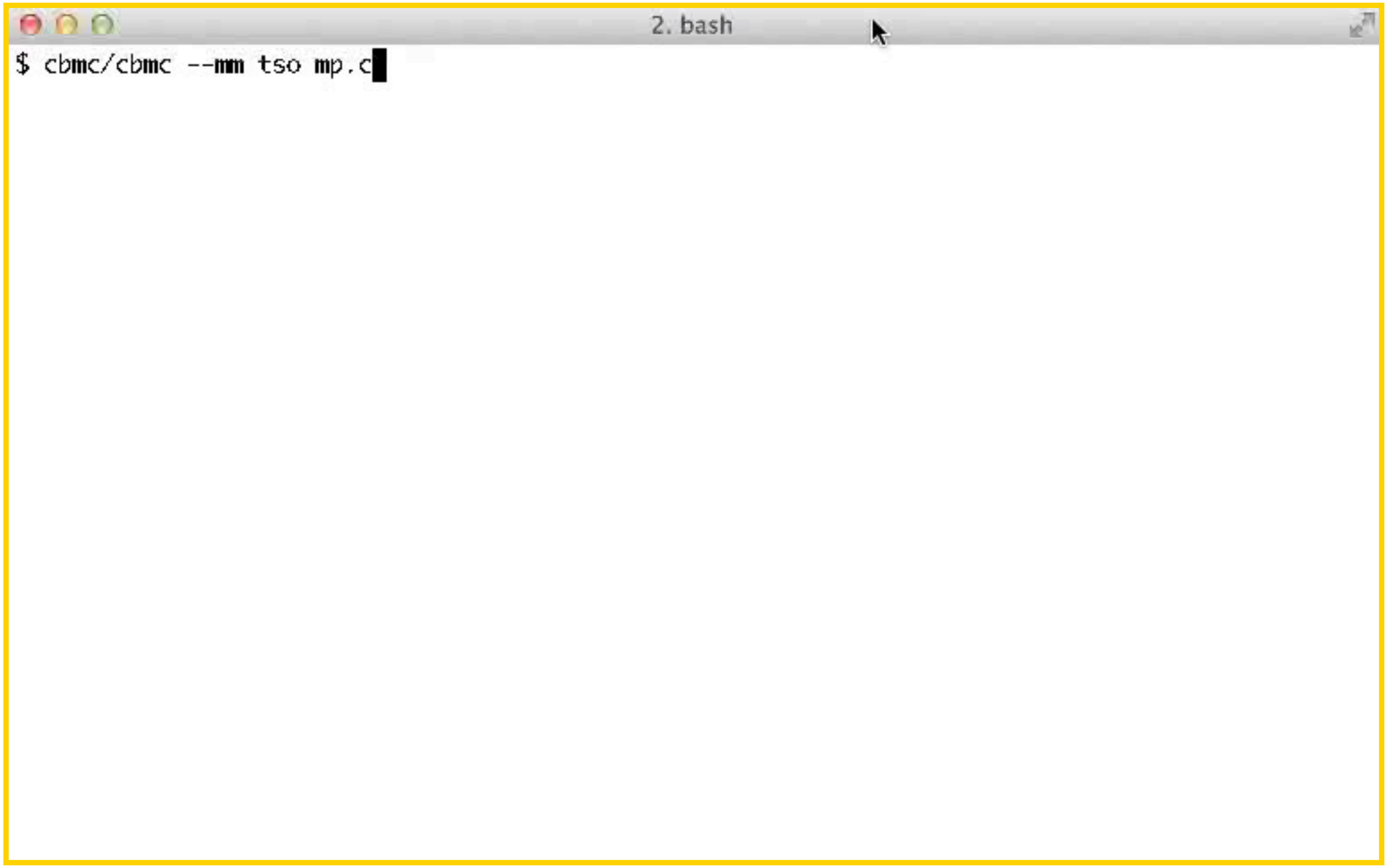
```
$ cbmc/cbmc --mm sc mp.c
```

Applying CBMC to this piece of code



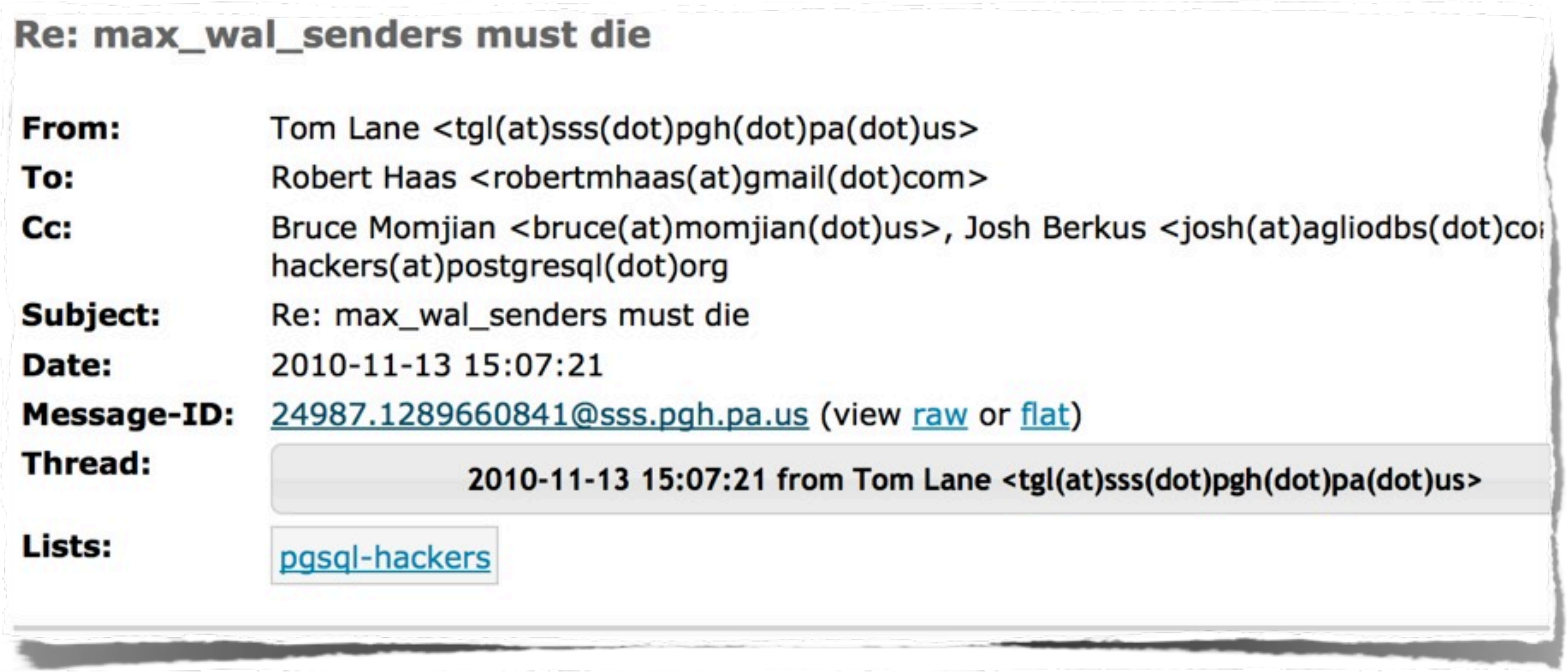
```
$ cbmc/cbmc --mm sc mp.c
```

Applying CBMC to this piece of code



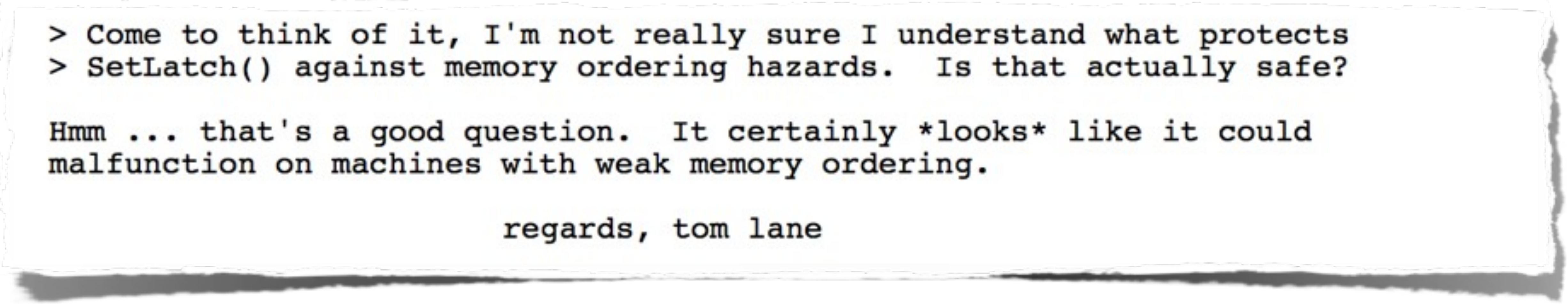
```
$ cbmc/cbmc --mm tso mp.c
```

What could Software Model Checking do for us?



Re: max_wal_senders must die

From: Tom Lane <tgl(at)sss(dot)pgh(dot)pa(dot)us>
To: Robert Haas <robertmhaas(at)gmail(dot)com>
Cc: Bruce Momjian <bruce(at)momjian(dot)us>, Josh Berkus <josh(at)agliodbs(dot)co
hackers(at)postgresql(dot)org
Subject: Re: max_wal_senders must die
Date: 2010-11-13 15:07:21
Message-ID: 24987.1289660841@sss.pgh.pa.us (view raw or flat)
Thread: 2010-11-13 15:07:21 from Tom Lane <tgl(at)sss(dot)pgh(dot)pa(dot)us>
Lists: pgsql-hackers

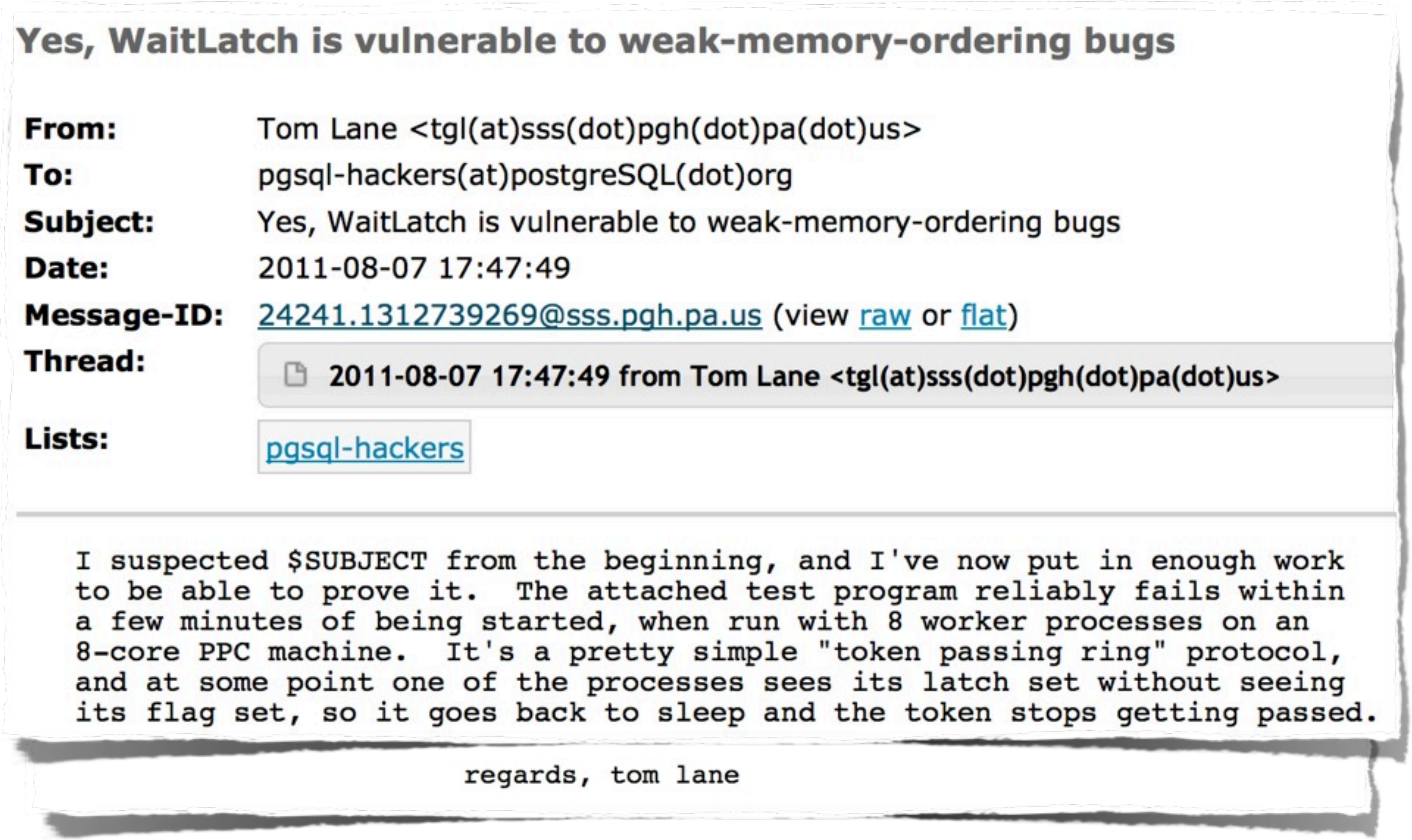


```
> Come to think of it, I'm not really sure I understand what protects
> SetLatch() against memory ordering hazards.  Is that actually safe?

Hmm ... that's a good question.  It certainly *looks* like it could
malfunction on machines with weak memory ordering.

                        regards, tom lane
```

What could Software Model Checking do for us?



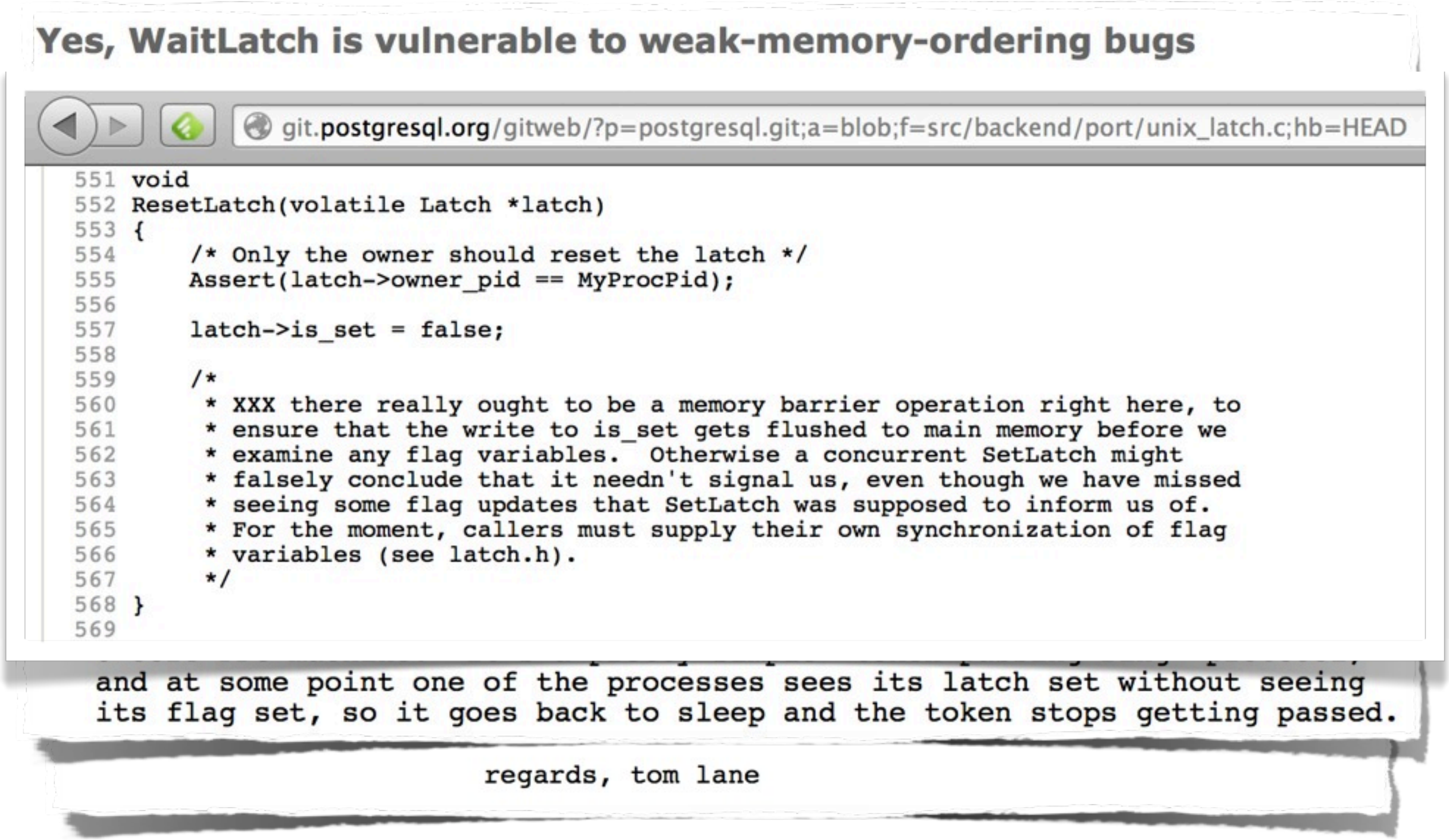
Yes, WaitLatch is vulnerable to weak-memory-ordering bugs

From: Tom Lane <tgl(at)sss(dot)pgh(dot)pa(dot)us>
To: pgsql-hackers(at)postgreSQL(dot)org
Subject: Yes, WaitLatch is vulnerable to weak-memory-ordering bugs
Date: 2011-08-07 17:47:49
Message-ID: 24241.1312739269@sss.pgh.pa.us (view raw or flat)
Thread: 2011-08-07 17:47:49 from Tom Lane <tgl(at)sss(dot)pgh(dot)pa(dot)us>
Lists: pgsql-hackers

```
I suspected $SUBJECT from the beginning, and I've now put in enough work
to be able to prove it.  The attached test program reliably fails within
a few minutes of being started, when run with 8 worker processes on an
8-core PPC machine.  It's a pretty simple "token passing ring" protocol,
and at some point one of the processes sees its latch set without seeing
its flag set, so it goes back to sleep and the token stops getting passed.

                        regards, tom lane
```

What could Software Model Checking do for us?



Yes, WaitLatch is vulnerable to weak-memory-ordering bugs

git.postgresql.org/gitweb/?p=postgresql.git;a=blob;f=src/backend/port/unix_latch.c;hb=HEAD

```
void
ResetLatch(volatile Latch *latch)
{
	/* Only the owner should reset the latch */
	Assert(latch->owner_pid == MyProcPid);

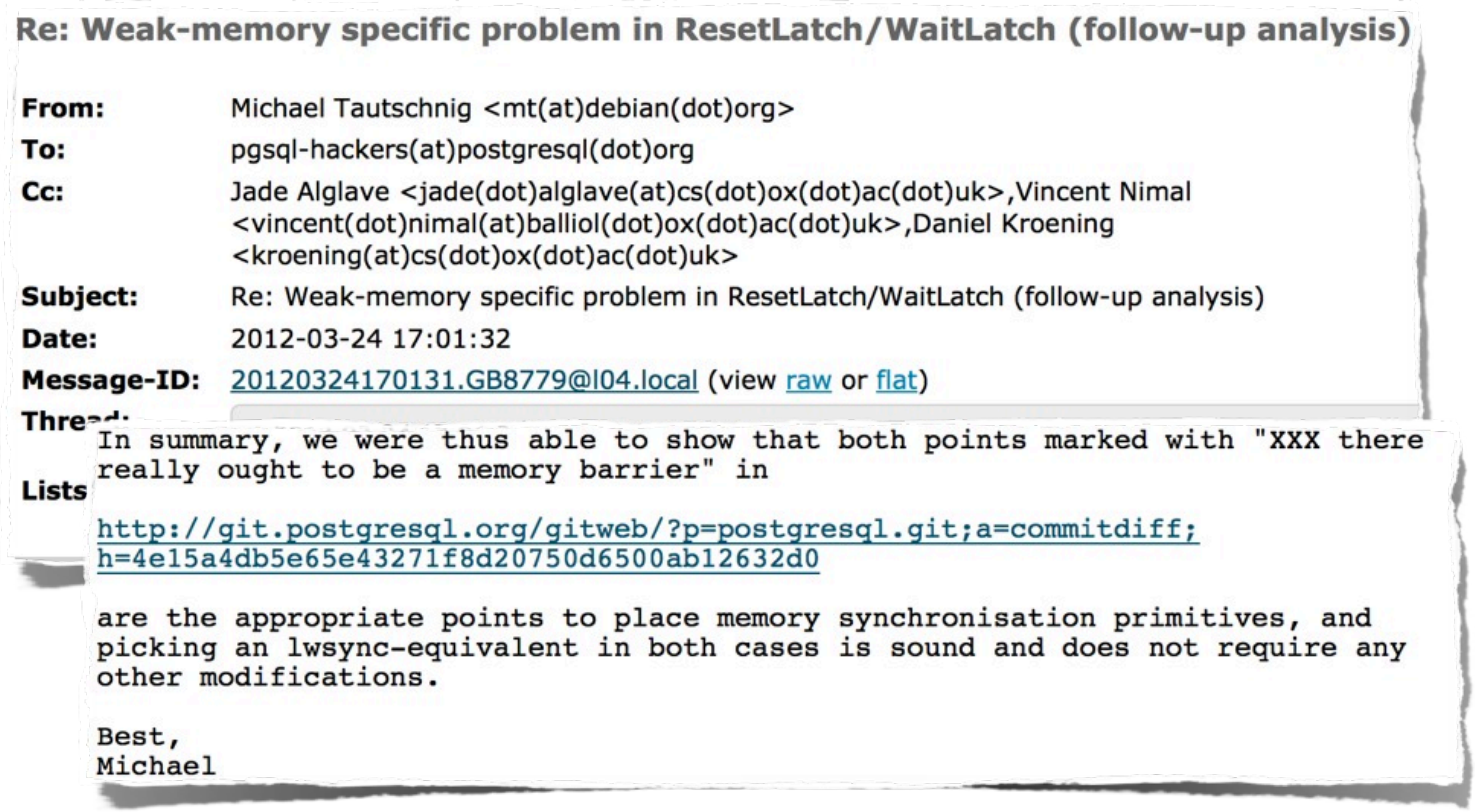
	latch->is_set = false;

	/*
	 * XXX there really ought to be a memory barrier operation right here, to
	 * ensure that the write to is_set gets flushed to main memory before we
	 * examine any flag variables.  Otherwise a concurrent SetLatch might
	 * falsely conclude that it needn't signal us, even though we have missed
	 * seeing some flag updates that SetLatch was supposed to inform us of.
	 * For the moment, callers must supply their own synchronization of flag
	 * variables (see latch.h).
	 */
}
```

and at some point one of the processes sees its latch set without seeing its flag set, so it goes back to sleep and the token stops getting passed.

regards, tom lane

What could Software Model Checking do for us?



Re: Weak-memory specific problem in ResetLatch/WaitLatch (follow-up analysis)

From:	Michael Tautschnig <mt(at)debian(dot)org>
To:	pgsql-hackers(at)postgresql(dot)org
Cc:	Jade Alglave <jade(dot)alglave(at)cs(dot)ox(dot)ac(dot)uk>,Vincent Nimal <vincent(dot)nimal(at)balliol(dot)ox(dot)ac(dot)uk>,Daniel Kroening <kroening(at)cs(dot)ox(dot)ac(dot)uk>
Subject:	Re: Weak-memory specific problem in ResetLatch/WaitLatch (follow-up analysis)
Date:	2012-03-24 17:01:32
Message-ID:	20120324170131.GB8779@l04.local (view raw or flat)
Thread:	
Lists	

```
In summary, we were thus able to show that both points marked with "XXX there
really ought to be a memory barrier" in

http://git.postgresql.org/gitweb/?p=postgresql.git;a=commitdiff;
h=4e15a4db5e65e43271f8d20750d6500ab12632d0

are the appropriate points to place memory synchronisation primitives, and
picking an lwsync-equivalent in both cases is sound and does not require any
other modifications.

Best,
Michael
```

What works at this stage?

- Other medium-scale experiments: proving the need of a barrier in read-copy-update in the Linux kernel

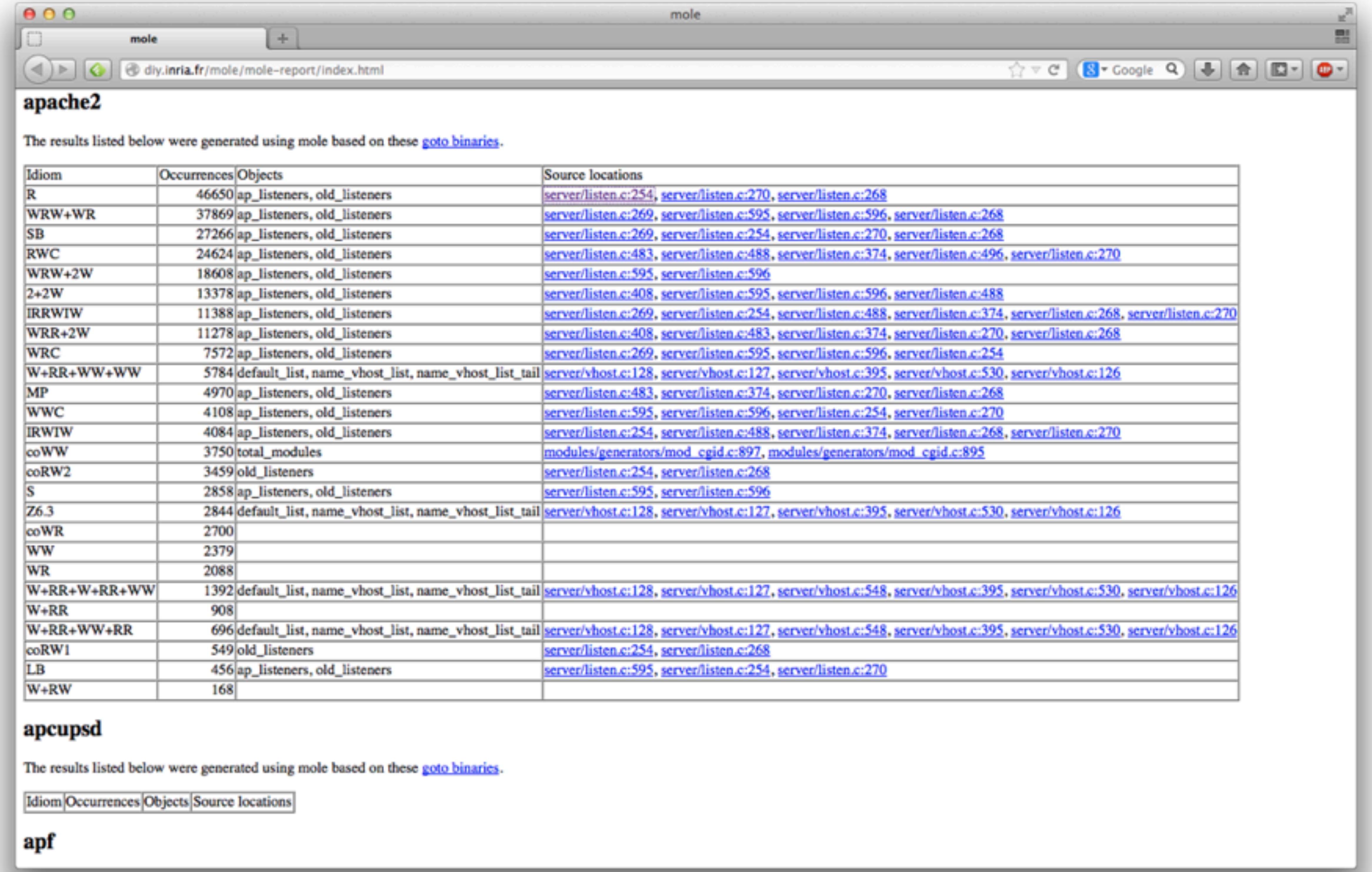
- More experiments required...

- In general: first step is successful compilation (and linking) in a way suitable for the tools
- How to automate experiments at large scale?

What can Debian do for Software Model Checking

- Linux distributions enable experiments at large scale
  - Wheezy has more than 400 million LOC
  - http://blog.james.rcpt.to/2012/02/13/debian-wheezy-us19-billion-your-price-free/
  - Broad range of ports makes Debian even more interesting
- In particular: uniform build system
- Great infrastructure such as sources.debian.net

For example: analysing 200 million LOC for potential weak memory susceptibility



apache2

The results listed below were generated using mole based on these goto binaries.

Idiom	Occurrences	Objects	Source locations
R	46650	ap_listeners, old_listeners	server/listen.c:254, server/listen.c:270, server/listen.c:268
WRW+WR	37869	ap_listeners, old_listeners	server/listen.c:269, server/listen.c:595, server/listen.c:596, server/listen.c:268
SB	27266	ap_listeners, old_listeners	server/listen.c:269, server/listen.c:254, server/listen.c:270, server/listen.c:268
RWC	24624	ap_listeners, old_listeners	server/listen.c:483, server/listen.c:488, server/listen.c:374, server/listen.c:496, server/listen.c:270
WRW+2W	18608	ap_listeners, old_listeners	server/listen.c:595, server/listen.c:596
2+2W	13378	ap_listeners, old_listeners	server/listen.c:408, server/listen.c:595, server/listen.c:596, server/listen.c:488
IRRWIW	11388	ap_listeners, old_listeners	server/listen.c:269, server/listen.c:254, server/listen.c:488, server/listen.c:374, server/listen.c:268, server/listen.c:270
WRR+2W	11278	ap_listeners, old_listeners	server/listen.c:408, server/listen.c:483, server/listen.c:374, server/listen.c:270, server/listen.c:268
WRC	7572	ap_listeners, old_listeners	server/listen.c:269, server/listen.c:595, server/listen.c:596, server/listen.c:254
W+RR+WW+WW	5784	default_list, name_vhost_list, name_vhost_list_tail	server/vhost.c:128, server/vhost.c:127, server/vhost.c:395, server/vhost.c:530, server/vhost.c:126
MP	4970	ap_listeners, old_listeners	server/listen.c:483, server/listen.c:374, server/listen.c:270, server/listen.c:268
WWC	4108	ap_listeners, old_listeners	server/listen.c:595, server/listen.c:596, server/listen.c:254, server/listen.c:270
IRWIW	4084	ap_listeners, old_listeners	server/listen.c:254, server/listen.c:488, server/listen.c:374, server/listen.c:268, server/listen.c:270
coWW	3750	total_modules	modules/generators/mod_cgid.c:897, modules/generators/mod_cgid.c:895
coRW2	3459	old_listeners	server/listen.c:254, server/listen.c:268
S	2858	ap_listeners, old_listeners	server/listen.c:595, server/listen.c:596
Z6.3	2844	default_list, name_vhost_list, name_vhost_list_tail	server/vhost.c:128, server/vhost.c:127, server/vhost.c:395, server/vhost.c:530, server/vhost.c:126
coWR	2700		
WW	2379		
WR	2088		
W+RR+W+RR+WW	1392	default_list, name_vhost_list, name_vhost_list_tail	server/vhost.c:128, server/vhost.c:127, server/vhost.c:548, server/vhost.c:395, server/vhost.c:530, server/vhost.c:126
W+RR	908		
W+RR+WW+RR	696	default_list, name_vhost_list, name_vhost_list_tail	server/vhost.c:128, server/vhost.c:127, server/vhost.c:548, server/vhost.c:395, server/vhost.c:530, server/vhost.c:126
coRW1	549	old_listeners	server/listen.c:254, server/listen.c:268
LB	456	ap_listeners, old_listeners	server/listen.c:595, server/listen.c:254, server/listen.c:270
W+RW	168		

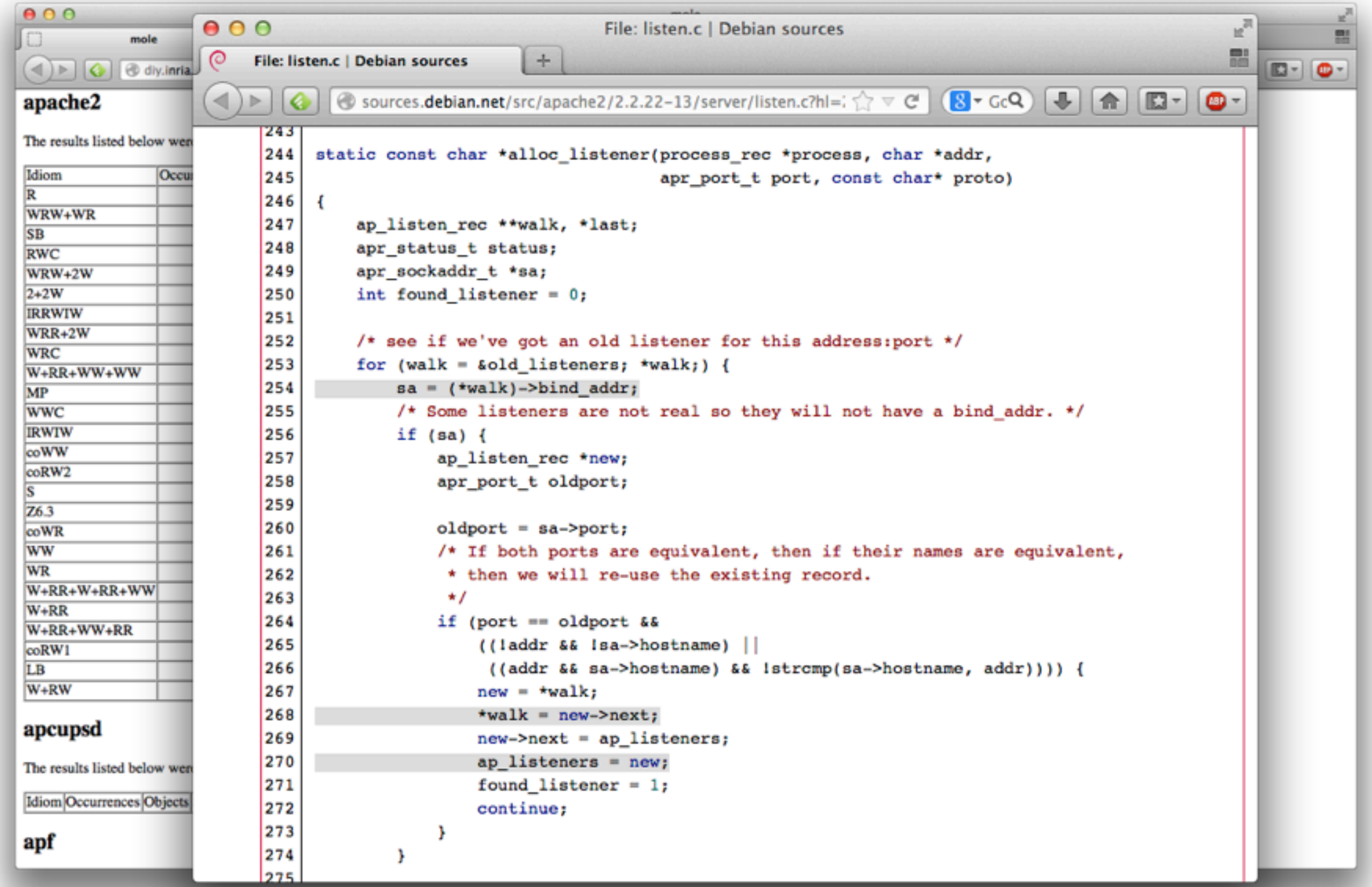
apcupsd

The results listed below were generated using mole based on these goto binaries.

Idiom	Occurrences	Objects	Source locations

apf

For example: analysing 200 million LOC for potential weak memory susceptibility



mole
diy.inria
File: listen.c | Debian sources
sources.debian.net/src/apache2/2.2.22-13/server/listen.c?hl=

apache2

The results listed below wer

Idiom	Occu
R	
WRW+WR	
SB	
RWC	
WRW+2W	
2+2W	
IRRWIW	
WRR+2W	
WRC	
W+RR+WW+WW	
MP	
WWC	
IRWIW	
coWW	
coRW2	
S	
Z6.3	
coWR	
WW	
WR	
W+RR+W+RR+WW	
W+RR	
W+RR+WW+RR	
coRW1	
LB	
W+RW	

apcupsd

The results listed below wer

Idiom	Occurrences	Objects

apf

```
static const char *alloc_listener(process_rec *process, char *addr,
                                  apr_port_t port, const char* proto)
{
    ap_listen_rec **walk, *last;
    apr_status_t status;
    apr_sockaddr_t *sa;
    int found_listener = 0;

    /* see if we've got an old listener for this address:port */
    for (walk = &old_listeners; *walk;) {
        sa = (*walk)->bind_addr;
        /* Some listeners are not real so they will not have a bind_addr. */
        if (sa) {
            ap_listen_rec *new;
            apr_port_t oldport;

            oldport = sa->port;
            /* If both ports are equivalent, then if their names are equivalent,
             * then we will re-use the existing record.
             */
            if (port == oldport &&
                ((!addr && !sa->hostname) ||
                 ((addr && sa->hostname) && !strcmp(sa->hostname, addr)))) {
                new = *walk;
                *walk = new->next;
                new->next = ap_listeners;
                ap_listeners = new;
                found_listener = 1;
                continue;
            }
        }
```

First steps

- Compiling packages using goto-cc
  - goto-cc builds intermediate-representation object files for CBMC/CProver tools
  - goto-cc accepts (most of) gcc's options
- Sanity check: dumping intermediate representation back as C code (using goto-instrument)

- Both goto-cc and goto-instrument are part of the cbmc package

Initial Experiments

- Following http://www.hermann-uwe.de/blog/rebuilding-the-whole-debian-archive-using-the-open64-compiler

- Using cowbuilder/pbuilder
- gcc and ld in chroot replaced by bash script

- Running (multiple) buildall instances (pbuilder package)

- Mostly works using sudo
- Debugging sometimes requires root access

- Scripts, notes: https://github.com/tautschnig/cprover-debian

Package builds using goto-cc

- goto-cc builds intermediate representation, not executable
- Link-time type checking
- Scripts replacing link dest of /usr/bin/gcc, /usr/bin/ld

1. Run real gcc/ld
2. Parse selected options (e.g. find output file name)
3. Compile/link using goto-cc and add result as additional ELF section

- Resulting file remains executable
- Stable under file renaming

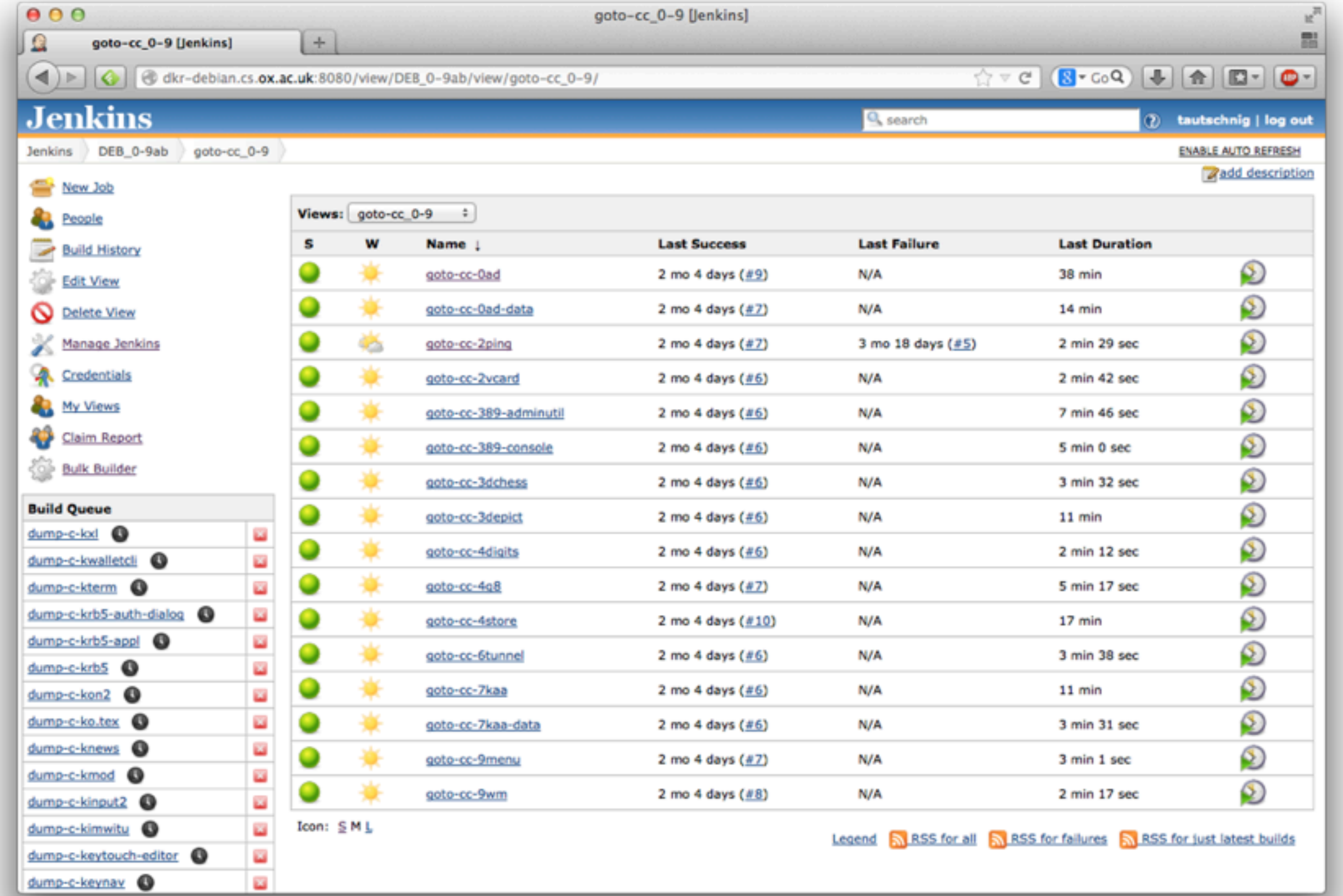
Some future Improvements

- Currently only C front-end sufficiently complete
  - No support for nested functions (like Clang)
- ~700 packages FTBFS
- Should install build depends from local build
  - goto-cc sections only present in package-local libraries, not in build deps

goto-instrument --dump-c

- Intermediate representation only has goto for control flow
- Maintains variable names, source code locations
- Human-readable C code constructed
  - Loops, if/else, switch restored
  - Formatted
- Tested for compilation and convergence
- Many failures caused by missing function declarations

Jenkins Setup



goto-cc_0-9 [Jenkins]

dkr-debian.cs.ox.ac.uk:8080/view/DEB_0-9ab/view/goto-cc_0-9/

Jenkins

search

tautschnig | log out

Jenkins › DEB_0-9ab › goto-cc_0-9

ENABLE AUTO REFRESH

add description

- New Job
- People
- Build History
- Edit View
- Delete View
- Manage Jenkins
- Credentials
- My Views
- Claim Report
- Bulk Builder

Build Queue

- dump-c-kxl
- dump-c-kwalletcli
- dump-c-kterm
- dump-c-krb5-auth-dialog
- dump-c-krb5-appl
- dump-c-krb5
- dump-c-kon2
- dump-c-ko.tex
- dump-c-knews
- dump-c-kmod
- dump-c-kinput2
- dump-c-kimwitu
- dump-c-keytouch-editor
- dump-c-keynav

Views: goto-cc_0-9

S	W	Name ↓	Last Success	Last Failure	Last Duration
●	☀	goto-cc-0ad	2 mo 4 days (#9)	N/A	38 min
●	☀	goto-cc-0ad-data	2 mo 4 days (#7)	N/A	14 min
●	⛅	goto-cc-2ping	2 mo 4 days (#7)	3 mo 18 days (#5)	2 min 29 sec
●	☀	goto-cc-2vcard	2 mo 4 days (#6)	N/A	2 min 42 sec
●	☀	goto-cc-389-adminutil	2 mo 4 days (#6)	N/A	7 min 46 sec
●	☀	goto-cc-389-console	2 mo 4 days (#6)	N/A	5 min 0 sec
●	☀	goto-cc-3dchess	2 mo 4 days (#6)	N/A	3 min 32 sec
●	☀	goto-cc-3depict	2 mo 4 days (#6)	N/A	11 min
●	☀	goto-cc-4digits	2 mo 4 days (#6)	N/A	2 min 12 sec
●	☀	goto-cc-4g8	2 mo 4 days (#7)	N/A	5 min 17 sec
●	☀	goto-cc-4store	2 mo 4 days (#10)	N/A	17 min
●	☀	goto-cc-6tunnel	2 mo 4 days (#6)	N/A	3 min 38 sec
●	☀	goto-cc-7kaa	2 mo 4 days (#6)	N/A	11 min
●	☀	goto-cc-7kaa-data	2 mo 4 days (#6)	N/A	3 min 31 sec
●	☀	goto-cc-9menu	2 mo 4 days (#7)	N/A	3 min 1 sec
●	☀	goto-cc-9wm	2 mo 4 days (#8)	N/A	2 min 17 sec

Icon: S M L

Legend RSS for all RSS for failures RSS for just latest builds

Jenkins Setup

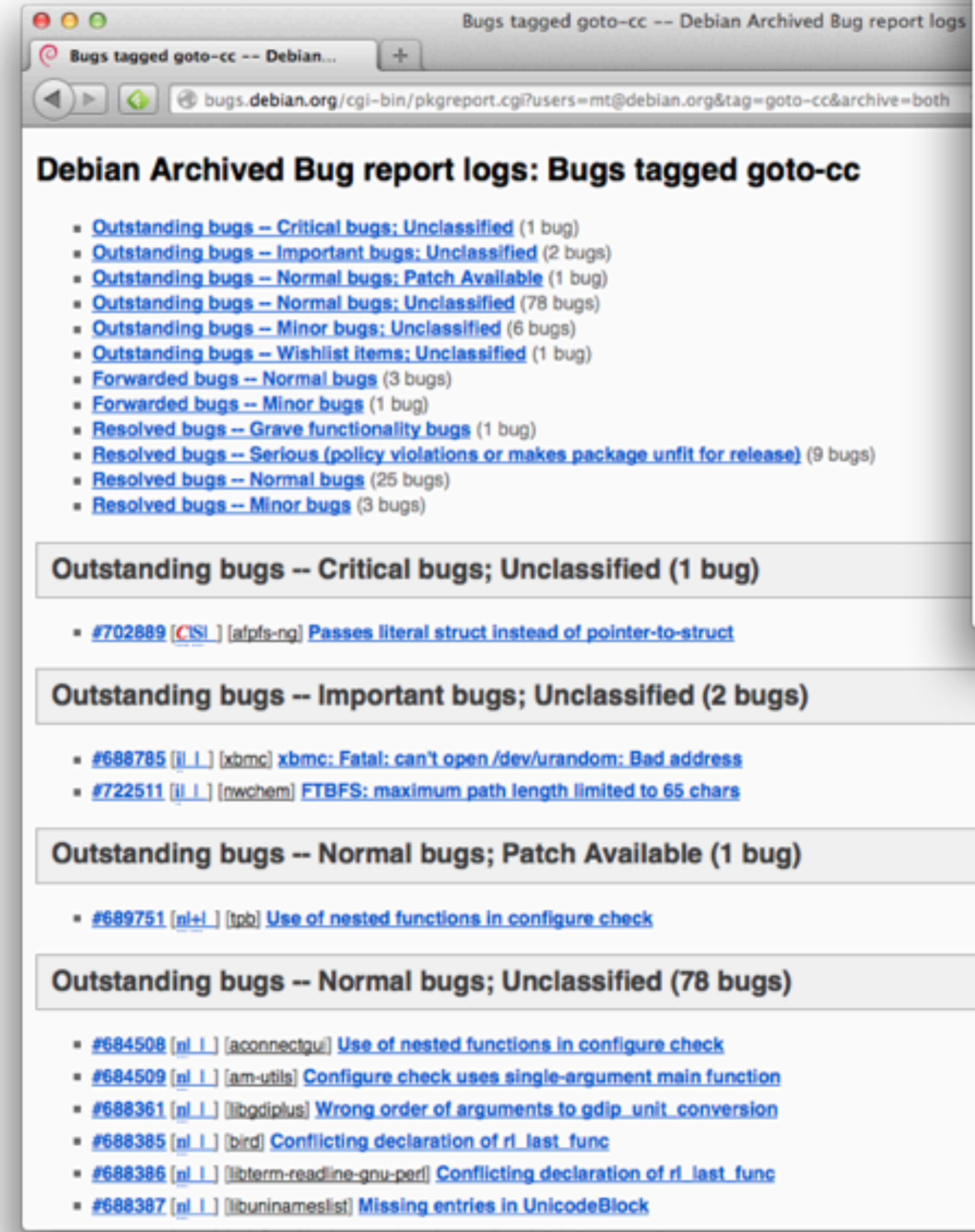
- One job per tool and package, generated using job-dsl plug-in
- debile didn't yet exist 1 year ago ...

- Pros:
  - Easy to set up
  - Rich collection of plug-ins (job-dsl, bulk builder, claims)
  - Master/slave support
  - Usable by non-tech users
- Cons:
  - Limited scalability (~36000 jobs!)
  - Java web application uses ~17GB RAM
  - Some pages put heavy strain on browser

Observations

- Verbose build logs would be valuable for debugging
- Reporting bugs:
  - What should be considered a bug?
  - (Almost) all bugs are upstream errors
    - Need account with all upstream BTS’
    - Upstream dead/no BTS
  - http://bugs.debian.org/cgi-bin/pkgreport.cgi?users=mt@debian.org&tag=goto-cc&archive=both

Reporting bugs



Bugs tagged goto-cc -- Debian Archived Bug report logs
Bugs tagged goto-cc -- Debian...
bugs.debian.org/cgi-bin/pkgreport.cgi?users=mt@debian.org&tag=goto-cc&archive=both

Debian Archived Bug report logs: Bugs tagged goto-cc

- Outstanding bugs -- Critical bugs; Unclassified (1 bug)
- Outstanding bugs -- Important bugs; Unclassified (2 bugs)
- Outstanding bugs -- Normal bugs; Patch Available (1 bug)
- Outstanding bugs -- Normal bugs; Unclassified (78 bugs)
- Outstanding bugs -- Minor bugs; Unclassified (6 bugs)
- Outstanding bugs -- Wishlist items; Unclassified (1 bug)
- Forwarded bugs -- Normal bugs (3 bugs)
- Forwarded bugs -- Minor bugs (1 bug)
- Resolved bugs -- Grave functionality bugs (1 bug)
- Resolved bugs -- Serious (policy violations or makes package unfit for release) (9 bugs)
- Resolved bugs -- Normal bugs (25 bugs)
- Resolved bugs -- Minor bugs (3 bugs)

Outstanding bugs -- Critical bugs; Unclassified (1 bug)

- #702889 [C|S|] [afpfs-ng] Passes literal struct instead of pointer-to-struct

Outstanding bugs -- Important bugs; Unclassified (2 bugs)

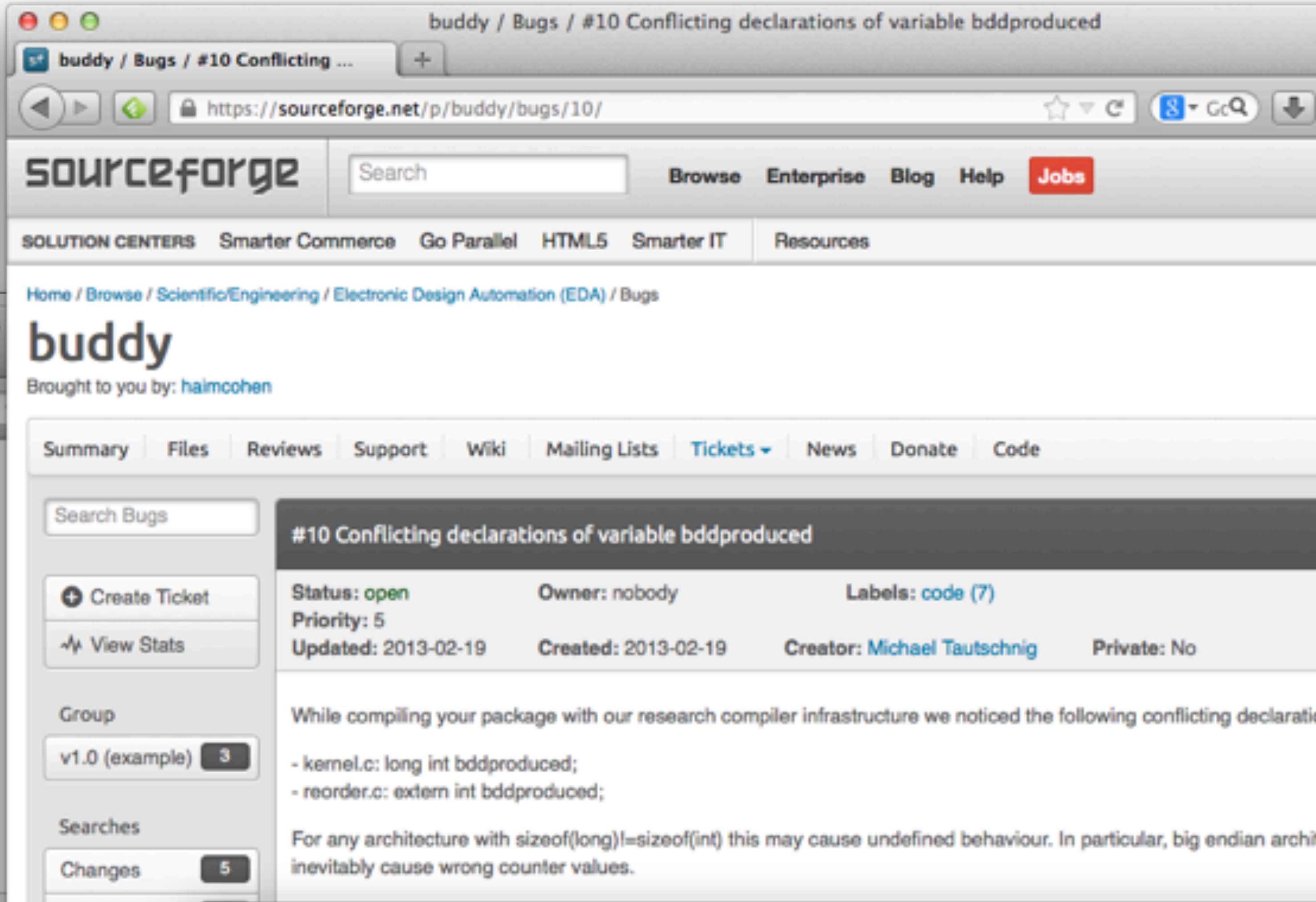
- #688785 [i| |] [xbmc] xbmc: Fatal: can't open /dev/urandom: Bad address
- #722511 [i| |] [nwchem] FTBFS: maximum path length limited to 65 chars

Outstanding bugs -- Normal bugs; Patch Available (1 bug)

- #689751 [n|+|] [tpb] Use of nested functions in configure check

Outstanding bugs -- Normal bugs; Unclassified (78 bugs)

- #684508 [n| |] [aconnectgui] Use of nested functions in configure check
- #684509 [n| |] [am-utils] Configure check uses single-argument main function
- #688361 [n| |] [libgdiplus] Wrong order of arguments to gdip_unit_conversion
- #688385 [n| |] [bird] Conflicting declaration of rl_last_func
- #688386 [n| |] [libterm-readline-gnu-perl] Conflicting declaration of rl_last_func
- #688387 [n| |] [libuninameslist] Missing entries in UnicodeBlock



buddy / Bugs / #10 Conflicting declarations of variable bddproduced
buddy / Bugs / #10 Conflicting ...
https://sourceforge.net/p/buddy/bugs/10/
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Resources
Home / Browse / Scientific/Engineering / Electronic Design Automation (EDA) / Bugs

buddy

Brought to you by: haimcohen

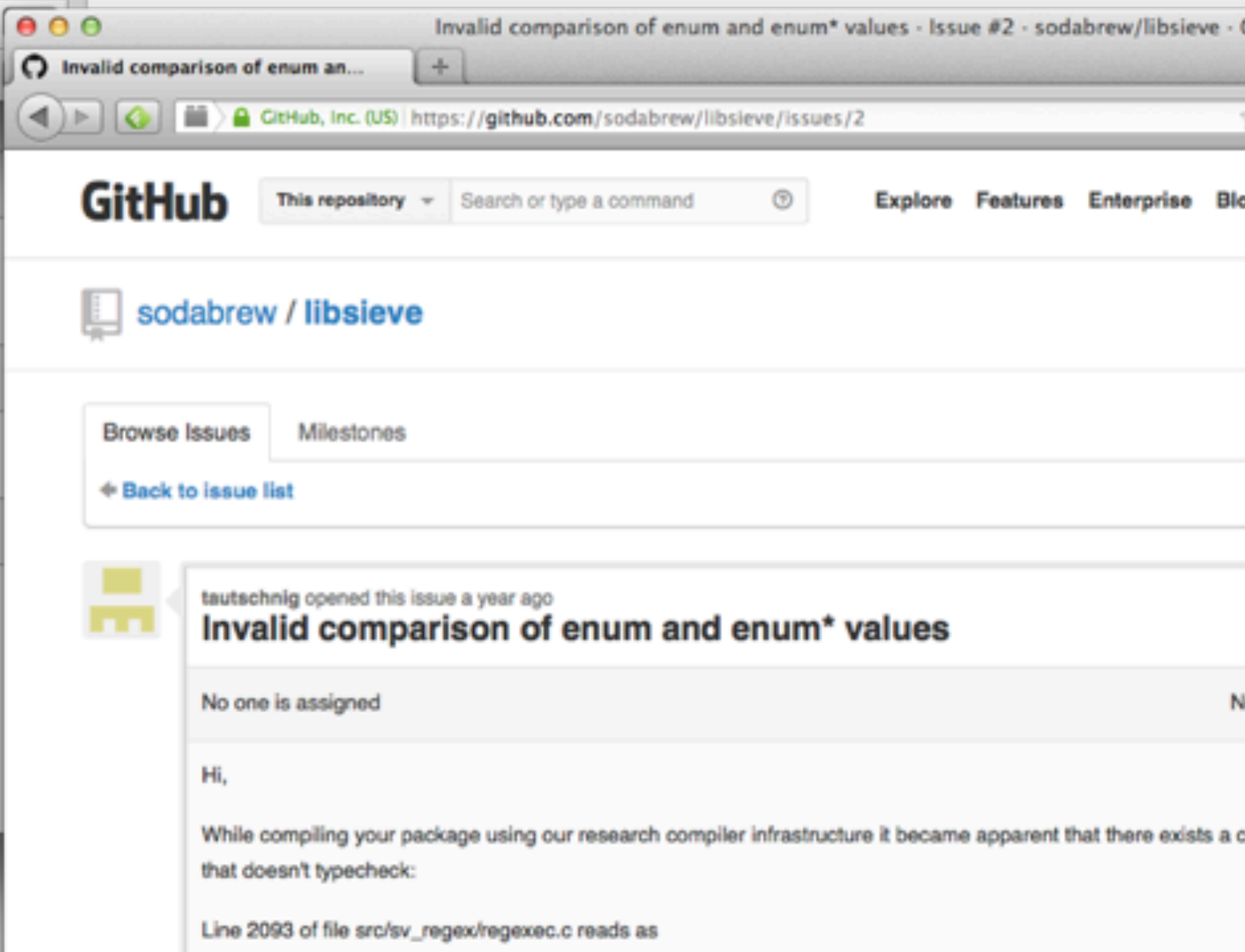
#10 Conflicting declarations of variable bddproduced

Status: open
Owner: nobody
Labels: code (7)
Priority: 5
Updated: 2013-02-19
Created: 2013-02-19
Creator: Michael Tautschnig
Private: No

While compiling your package with our research compiler infrastructure we noticed the following conflicting declarati

- kernel.c: long int bddproduced;
- reorder.c: extern int bddproduced;

For any architecture with sizeof(long)!=sizeof(int) this may cause undefined behaviour. In particular, big endian archi inevitably cause wrong counter values.



Invalid comparison of enum and enum* values · Issue #2 · sodabrew/libsieve
Invalid comparison of enum an...
GitHub, Inc. (US) https://github.com/sodabrew/libsieve/issues/2
GitHub
This repository
Search or type a command
Explore
Features
Enterprise
Blo
sodabrew / libsieve
Browse Issues
Milestones
Back to issue list

tautschnig opened this issue a year ago

Invalid comparison of enum and enum* values

No one is assigned

Hi,

While compiling your package using our research compiler infrastructure it became apparent that there exists a c that doesn't typecheck:

Line 2093 of file src/sv_regex/regexec.c reads as

Examples of Errors: rsync

```
file main.c line 58: error: conflicting types for variable `c::curr_dir_len'
old definition in module exclude file exclude.c line 41
unsigned int
new definition in module main file main.c line 58
signed int
```

Examples of Errors: yp-svipc

```
file ywrap.c line 81: error: conflicting types for variable `c::svipc_debug'
old definition in module yorick_svipc file ../common/svipc_misc.h line 52
signed int
new definition in module ywrap file ywrap.c line 81
char [4l]
```

Examples of Errors: xtux

```
file menu.c line 28: error: conflicting types for variable `c::num_entity_types'
old definition in module main file main.c line 23
unsigned char
new definition in module menu file menu.c line 28
signed int
```

Examples of Errors: simh

```
file PDP18B/pdp18b_fpp.c line 146: error: conflicting types for variable `c::pcq'
old definition in module pdp18b_cpu file PDP18B/pdp18b_cpu.c line 374
signed short int [64l]
new definition in module pdp18b_fpp file PDP18B/pdp18b_fpp.c line 146
signed int [64l]
```

Examples of Errors: xrdp

```
/bin/bash ../../libtool --tag=CC   --mode=link gcc -DXRDP_CFG_PATH=\"/etc/xrdp\" -DXRDP_SBIN_PATH=\"/usr/sbin\" -
DXRDP_SHARE_PATH=\"/usr/share/xrdp\" -DXRDP_PID_PATH=\"/var/run/xrdp\" -g -O2   -o xrdp-sesrun sesrun.o tcp.o config.o ../../
common/libcommon.la
libtool: link: gcc -DXRDP_CFG_PATH=\"/etc/xrdp\" -DXRDP_SBIN_PATH=\"/usr/sbin\" -DXRDP_SHARE_PATH=\"/usr/share/xrdp\" -
DXRDP_PID_PATH=\"/var/run/xrdp\" -g -O2 -o .libs/xrdp-sesrun sesrun.o tcp.o config.o  ../../common/.libs/libcommon.so -Wl,-rpath
-Wl,/usr/lib/xrdp
file config.c line 33: error: conflicting types for variable `c::g_cfg'
old definition in module sesrun file sesrun.c line 33
struct config_sesman {
  char [32l] listen_address;
  char [16l] listen_port;
  signed int enable_user_wm;
  char [32l] default_wm;
  char [32l] user_wm;
  unsigned int $pad0;
  char * auth_file_path;
  struct list * vnc_params;
  struct list * rdp_params;
  struct log_config log;
  struct config_security sec;
  struct config_sessions sess;
}
new definition in module config file config.c line 33
struct config_sesman {
  char [32l] listen_address;
  char [16l] listen_port;
  signed int enable_user_wm;
  char [32l] default_wm;
  char [32l] user_wm;
  unsigned int $pad0;
  char * auth_file_path;
  struct list * vnc_params;
  struct list * rdp_params;
  struct log_config log;
  struct config_security sec;
  struct config_sessions sess;
} *
```

Probably not an error: tiemu

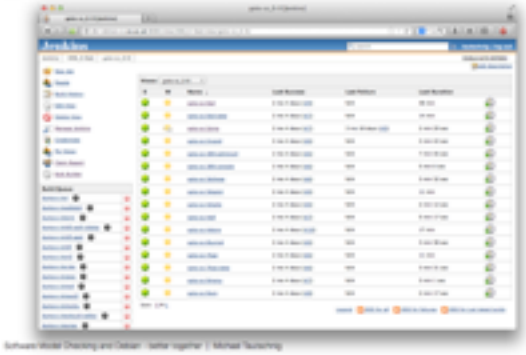
```
old definition in module calc file gui/calc/calc.c line 81
struct #anon#ST[S32'x'||S32'y'||S32'w'||S32'h'|] {
  signed int x;
  signed int y;
  signed int w;
  signed int h;
}
new definition in module screen file gui/calc/screen.c line 77
union #anon#UN[SYM#c::tag-#anon#ST[S32'x'||S32'y'||S32'w'||S32'h'|]#'wr'||SYM#c::tag-_GdkRectangle#'gr'|] {
  struct #anon#ST[S32'x'||S32'y'||S32'w'||S32'h'|] wr;
  struct _GdkRectangle gr;
}
```

Questions to you

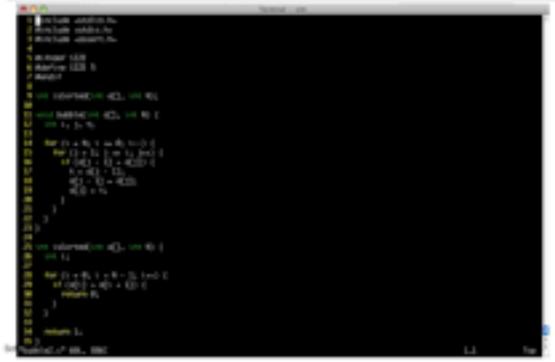
- Where can I find the most formal specification of linking?
- How to make diagnosing more efficient?

- Is this considered useful?

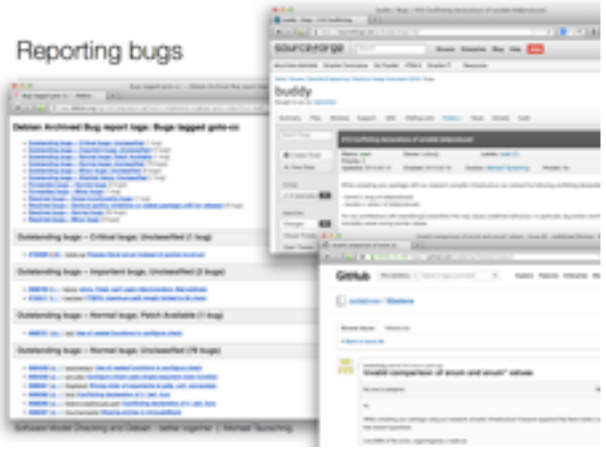
Jenkins setup



Model Checking



Reporting bugs



Questions