Harvey

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Welcome to Harvey! Thanks for coming!

- what it is
- gcc issues
- clang goals
- the build tool
- what we've learned
- current status

What is Harvey?

- Harvey is Plan 9 built with GCC and, we hope, Clang
- Started by Álvaro Jurado last spring
- Goal is to remove dependencies on some Plan 9 programs, starting with ken c, rc, and now mk
- Booting on qemu and hardware

gcc issues

- Biggest and baddest: callee save
  - Affects anything that involves exceptions and interrupts (error(), longjmp(), etc.)
  - About as hard as moving to a new architecture
- -fplan9
- AMD64 Red Zone --> kernel stack corruption
- Variadic functions calling variadic functions: easy in kenc, *ugly* in posix

Why some of us want CLANG

- GCC has very poor error handling
- This compiles without error in gcc and caused a bad problem in Akaros

```
char *x[] = {
    [0] "hi",
    [0] "there"
};
main() { printf(x[0]);}
```

- But not in CLANG!

build tool; dumb but good enough

- We named it “build”
- Dumb; just compiles always
- Designed to build a Plan 9 tree quickly
- Everything: 56 seconds; kernel 18 seconds
- build can be run at any level of source tree
  - unlike most “recursive” makes
- 336 lines of go
- “mkfile” replacements are JSON

Change control

- Using gerrithub.io
    - People are pretty happy with it
- Looking for a good “jenkins like” verification
    - full build
    - boot
    - regression tests

What we’ve learned

- Regression tests are crucial
    - We’re trying to push people to create “one regression test per fix”
    - not there yet :-)

cross-connect with akaros is great

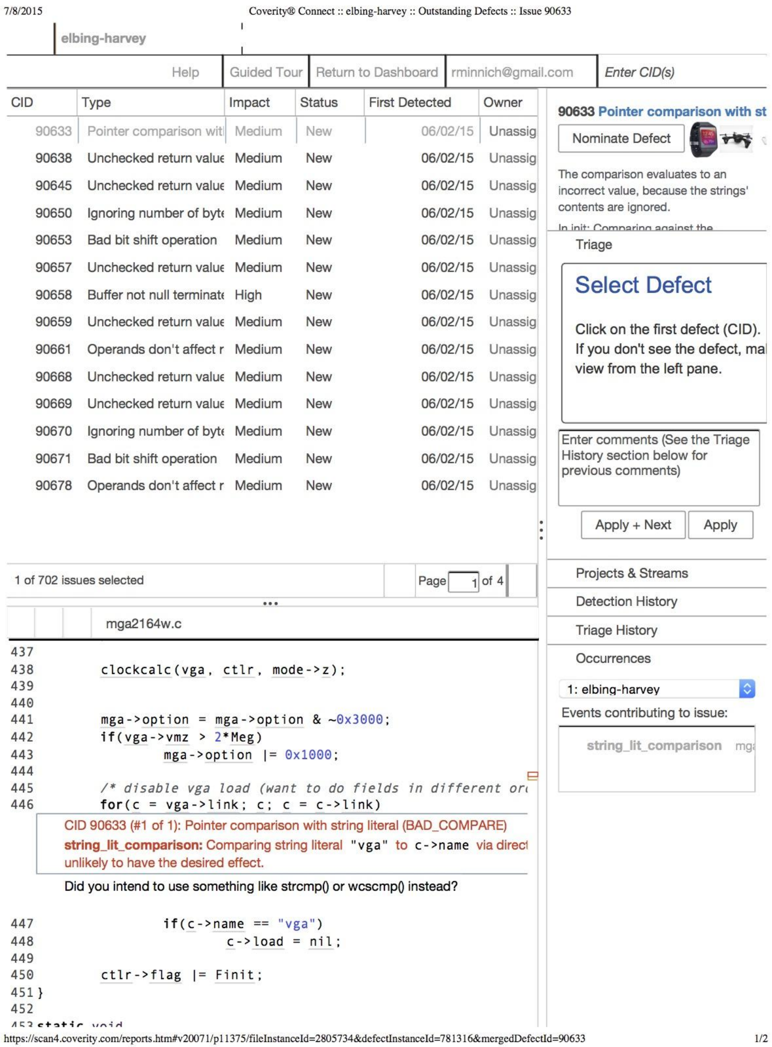
- echo sys > /dev/consctl --> trace everything
- We have /dev/kprof so we can get pretty perftool diagrams
- We’ll be getting a better tcp stack
- We will be creating things they can use
- The license change was crucial to this improvement

Other nice bits

- We (think we) can finally compile openssl/ssh etc. without fighting the toolchain
- We are now able to benefit from verification tools like Coverity
- We’re set up with coverity scan

example of coverity defect

- This is one of 600+
- And it’s kind of embarrassing
- Or maybe ken c had native strcmp, I have no idea.
- (this particular defect is gone, because we just removed support for this 1997 video card and others like it)



7/8/2015 Coverity® Connect :: elbing-harvey :: Outstanding Defects :: Issue 90633

CID	Type	Impact	Status	First Detected	Owner
90633	Pointer comparison wit	Medium	New	06/02/15	Unassig
90638	Unchecked return value	Medium	New	06/02/15	Unassig
90645	Unchecked return value	Medium	New	06/02/15	Unassig
90650	Ignoring number of byte	Medium	New	06/02/15	Unassig
90653	Bad bit shift operation	Medium	New	06/02/15	Unassig
90657	Unchecked return value	Medium	New	06/02/15	Unassig
90658	Buffer not null terminate	High	New	06/02/15	Unassig
90659	Unchecked return value	Medium	New	06/02/15	Unassig
90661	Operands don't affect r	Medium	New	06/02/15	Unassig
90668	Unchecked return value	Medium	New	06/02/15	Unassig
90669	Unchecked return value	Medium	New	06/02/15	Unassig
90670	Ignoring number of byte	Medium	New	06/02/15	Unassig
90671	Bad bit shift operation	Medium	New	06/02/15	Unassig
90678	Operands don't affect r	Medium	New	06/02/15	Unassig

1 of 702 issues selected

90633 Pointer comparison with st

The comparison evaluates to an incorrect value, because the strings' contents are ignored.

In init: Comparing against the

Select Defect

Click on the first defect (CID). If you don't see the defect, ma view from the left pane.

Enter comments (See the Triage History section below for previous comments)

Events contributing to issue:

string_lit_comparison mga

```

        clockcalc(vga, ctlr, mode->z);


        mga->option = mga->option & ~0x3000;
        if(vga->vmz > 2*Meg)
                mga->option |= 0x1000;

        /* disable vga load (want to do fields in different or
        for(c = vga->link; c; c = c->link)
```

CID 90633 (#1 of 1): Pointer comparison with string literal (BAD_COMPARE)
string_lit_comparison: Comparing string literal "vga" to c->name via direct unlikely to have the desired effect.

Did you intend to use something like strcmp() or wcscmp() instead?

```
                if(c->name == "vga")
                        c->load = nil;

        ctlr->flag |= Finit;
}

static void
```

https://scan4.coverity.com/reports.htm#v20071/p11375/fileInstanceId=2805734&defectInstanceId=781316&mergedDefectId=90633 1/2

And some real craziness

- We’re using gcc and …
- the binaries we build ~~run~~ almost run under linux
  - weird but true (***stopped working just recently***)
- “Dual mode binaries”
  - Use linux system call numbers for common calls
  - Use linux convention (syscall in %rax)

Summary

Check us out!

http://harvey-os.org

- Much better code process
- New tools (github, gerrit, coverity, gdb) speed development, bug fixes, commits, and code quality
- Can now build standard tools for Plan 9
  - no longer fighting the toolchain
- New people taking Plan 9 in new directions
  - With help from some of the old guard :-)