NetBSD Regression Testing

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Talk outline

- Introduce benefits of regression testing in operating system development in general
- Describe how we use available tools to achieve best system stability possible
- Explain some unique technology behind test system in netbsd.
- Show some examples
- Q&A

Why do we need tests ???

Good developers doesn’t make mistakes.

Regression Testing

- Operating systems are the most complex pieces of software

- Even small change can easily broke whole underlying or related subsystems.

- If errors are not caught soon enough after commit it's very hard to find out cause after some time
- We want to keep our users happy :)

Benefits of continuos testing

- More stable code base, with less amount of newly introduced bugs.

- Much more stable releases, because of continuos testing, stable releases introduce lower amount of new bugs

- Happy developers and users

Regression testing in NetBSD

- Automated Testing Suite - ATF written by jmmv@
  - http://www.netbsd.org/~jmmv/atf/

- RUMP system - written by pooka@
  - http://netbsd.org/docs/rump/index.html

- Automated NetBSD Installation and Test Application - Anita written by gson@
  - http://www.gson.org/netbsd/anita/

- Integrated build system with cross platform build support

What's RUMP

There is nothing like RUMP in any other project than NetBSD

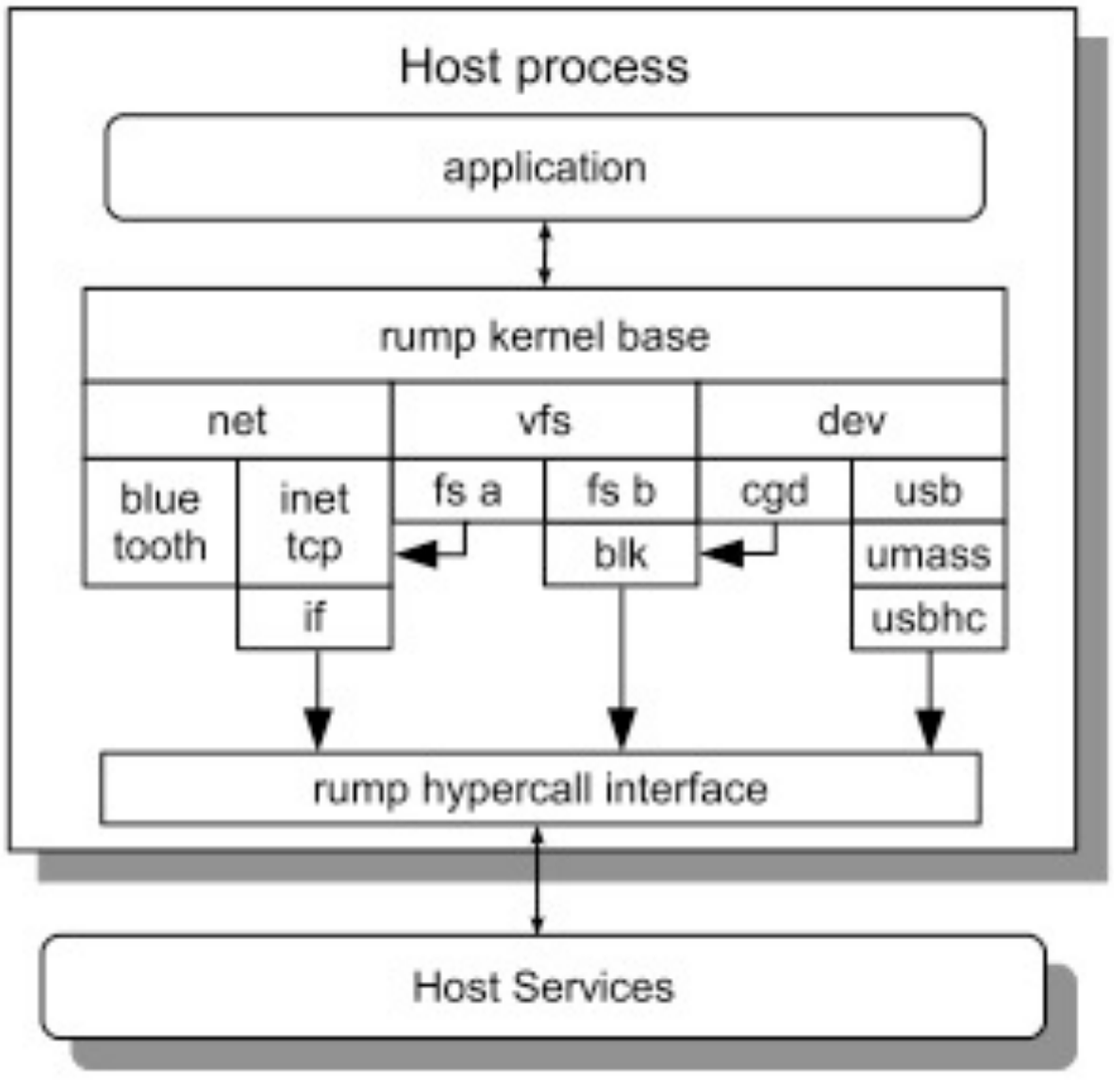
- Gives us ability to build almost whole kernel as user space libraries, from non-modified kernel sources

- It works for device drivers, network stack and filesystems, there is even wip support for running zfs inside RUMP

- It's crashproof and even kernel panic inside RUMP will not bring down host machine

- RUMP can forward syscalls made by application to different hosts.

One image is worth of thousands words



Usage of RUMP in tests

- RUMP is used to test kernel functionality, by using unmodified parts of kernel code

```
[haad@netbsd-dev dm]$ /usr/bin/rump_allserver unix:///tmp/dm
WARNING: module error: builtin module `zfs' failed to init
WARNING: ZFS on NetBSD is under development
[haad@netbsd-dev dm]$ export RUMP_SERVER=unix:///tmp/dm
[haad@netbsd-dev dm]$ rump.modstat
NAME            CLASS      SOURCE     REFS  SIZE     REQUIRES
bpf             driver     builtin    0     -        -
cd9660          vfs        builtin    0     -        -
cgd             driver     builtin    0     -        -
dm              driver     builtin    0     -        -
solaris         misc       builtin    2     -        -
wapbl           vfs        builtin    0     -        -
zfs             vfs        builtin    0     -        solaris

# Using dmctl for RUMP
[root@netbsd-dev dmctl]# ./dmctl targets
Target name: linear
Target version 1.0.2
Target name: striped
Target version 1.0.3
```

Anita

- Automated way to install netbsd on VM with qemu and run test suite.
- Uses expect to see what's going on screen and sent proper responses.
- Easy way to run tests from build cluster.

- http://releng.netbsd.org/test-results.html

More Info

- http://releng.netbsd.org/test-results.html
- http://releng.netbsd.org/cgi-bin/builds.cgi
- src/sys/rump, src/tests
- http://netbsd.org/docs/rump/index.html

Questions & Answers

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