Experiences and lessons we learned using kselftest

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A date in the future
Who is Anders?

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Linaro engineer
10+ years in Embedded
Involved with the kernel for 6+ years (Kselftest for 1+ years)
Prefer sausages, cheese and beer.
So why are we here?

- The story of Kselftest (to this date)?
- Why and how Linaro runs Kselftest
- Linaro contributions to Kselftest
- Future plans
What is kselftest?

The Linux Kernel contains a set of developers unit and regression tests. (tools/testing/selftests)

Why is this needed?
- Identify regressions in the Linux Kernel

Who is it targeted at?
- Primarily to Kernel developers, but testers and users can also use it

https://kselftest.wiki.kernel.org/
When do we run Kselftest

When a new Kernel gets pushed (commits or tags), LKFT builds an OE image with the Kernel + Kselftest and run it in LAVA on real hardware.
Why and what version Linaro runs of Kselftest?

Kernel versions being tested:

- LTS kernels
  - Today: 4.4, 4.9, 4.14, 4.19
- ‘Latest’ released kernel
  - Today: 5.0
- Mainline
- Next

Kselftest versions being used for those tests:

- Latest released Kselftest (i.e., ‘Latest’ released kernel)
- in-tree Kselftest

https://www.kernel.org/category/releases.html
Linaro contributions to Kselftest

- Dashboard
- Email reporting
- Headers built if a subsystem needs it
- Config fragment files
- Bug fixes


Presentation icons

=BEFORE
=NOW
=AFTER
1: Email reports on LTS and next kernels

Screencap of email report

Ref:

https://github.com/Linaro/squad.git
https://github.com/Linaro/lkft-tools.git
2: Dashboard

From QA-reports to report the issue or submit a patch to test the proposed fix
3: Framework changes - config changes

Hard to figure out what kernel fragment was needed to run Kselftest from a specific subsystem.

Have a config file in every subsystem directory that needs specific features enabled.
4: Framework changes - build changes

Generate headers -> build kselftest.

If a subsystem needs headers they will be generated.
5: Bug fixes

From QA-reports to report the issue or submit a patch to test the proposed fix

What kind of bugs:
- Kernel bugs or
- Kselftest bugs
Future plans

Out-of-tree build with a relative path

Use an ‘allmodconfig’ built kernel

Runtime check if a feature is enabled or not

Use headers from the tools directory only and don’t mix them with the headers from headers install

Add Kselftest to kernelCI
1: Out of tree build with a relative path

Uses its “own” build system in tools/

Should try to use Kbuild
2: Runtime check if a feature is enabled or not

Running an old kselftest

Will make kselftest able to run on any kernel
3: Use a ‘allmodconfig’ built kernel

‘allmodconfig’ is not booting

Hopefully we have an ‘allmodconfig’ kernel that boots

We should be able to run more test suites against one built kernel and its modules.

Why is it good to have a bootable ‘allmodconfig’ kernel?
4: Use headers from tools/ directory only and not mix them with headers_install

If a subsystem needs headers they will be generated.

Use the copy of the headers that is located in tools/include and tools/arch/*/include
5: Adding Kselftest to kernelCI

Available Test Group Reports

The results shown here cover the last 14 days of available data starting from Mon, 18 Mar 2019 (time is UTC based).

Outdated Kselftest run in kernelCI today

Introduce a way to build Kselftest in kernelCI
--> Enable it on more HW

https://kernelci.org/test/
Thank you

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contact@linaro.org