

Moving livepatch module building to kselftests

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Agenda

1. kselftests

What are kselftests and its goal

2. Livepatch testing modules

How tests are run today

3. Problems

kselftests weak points

4. Proposal

Our approach the problem

Kselftests

What are kselftests and its goal

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- Designed to exercise specific code paths in the kernel
- Only userspace tests
 - (bpf kernel module ?)
- Small programs
 - Shell scripts
 - Userspace programs
- Useful targets:
 - `make kselftest TARGETS=livepatch`
 - `make -C tools/testing/selftests run_tests`

Kselftests

- `make -C tools/testing/selftest gen_tar`
 - Packs compiled tests to be executed on different system
 - Only binaries
 - (And different systems...?)

Livepatch testing modules

How tests are run today

Livepatch testing modules

- Modules live on lib/livepatch
 - Only compiled on kernel build
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Livepatch testing modules

- Modules live on lib/livepatch
 - Only compiled on kernel build
 - CONFIG_TEST_LIVEPATCH=m
- How to run the tests on different systems without having the kernel source?
 - How to run the tests on distro kernels?

Livepatch testing modules

`CONFIG_LIVEPATCH=y`
`CONFIG_TEST_LIVEPATCH=m`

Kernel building

`make modules_install`
`make install`
reboot

`make kselftest TARGETS=livepatch`

Livepatch testing modules

- qa_test_klp (https://github.com/SUSE/qa_test_klp/)
 - Out-of-tree tests
 - Compiles the test modules on the fly
 - Used on SLE kernels

Problems

Kselftest weak points

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- How to get the tests to run on different systems?
 - `gen_tar` only packs binaries
- Currently `kselftests` doesn't allow kernel modules
 - (bpf...?)
 - No rules to build modules
- When modules are built (with our proposal)
 - They can only run on machines with the same kernel version

Proposal

Our approach the problem

Proposal

- <https://lore.kernel.org/live-patching/20231031-send-lp-kselftests-v3-0-2b1655c2605f@suse.com/T/#t>
 - Already on v3

Proposal

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- Move modules from lib/livepatch to tools/testing/selftests/livepatch

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- Move modules from lib/livepatch to tools/testing/selftests/livepatch
- Compile the modules before running the tests
 - Makes the tests system agnostic
 - Need kernel-headers

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 - Already on v3
- Move modules from lib/livepatch to tools/testing/selftests/livepatch
- Compile the modules before running the tests
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 - Need kernel-headers
- Port the remaining tests from qa_test_klp

Proposal

- Future work:
 - Add option to `gen_tar` to enable building the sources on the target



Thank you

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