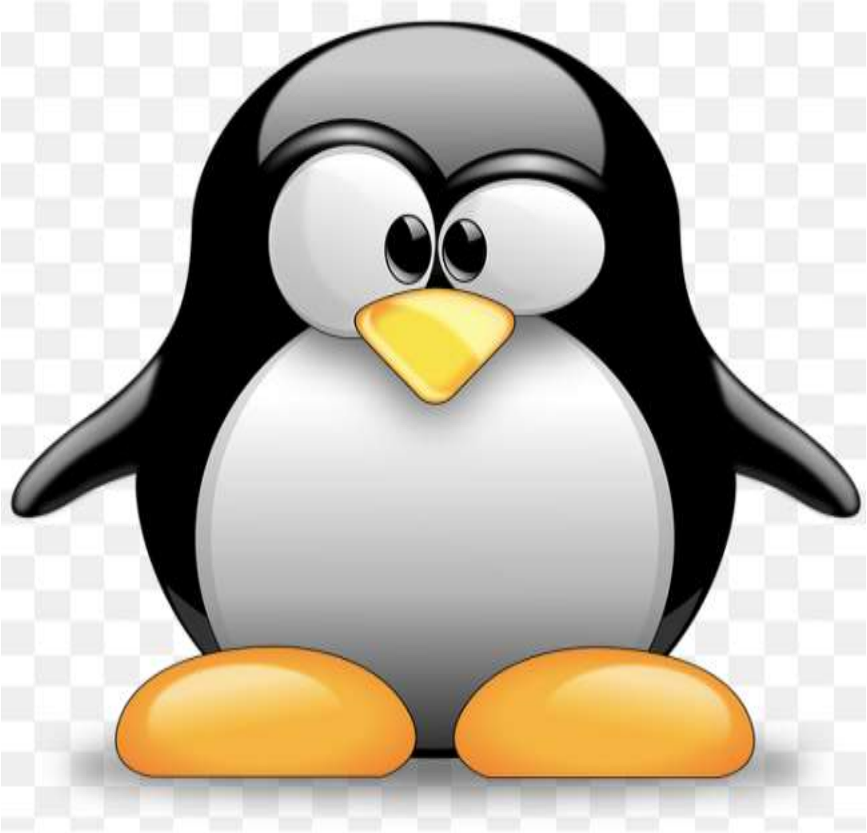
One Test Team Approach

Need for unified test case development

- Manvanthara Puttashankar

PROBLEM STATEMENTS



- Code changes elsewhere breaks the component you own?.
- Need time to understand test case which reported the failure. Is it even valid issue?
- Review process is time consuming / More patches to handle for limited Maintainers.
- Do not have access to other platform systems. So not sure if my code works?
- Backports did not pick all the relevant patches causing new regressions.

TEST CONFERENCE FLASHBACK (2014- 2017)

- "Storage vendors tests are kept private".
- Maintainers should do more yelling at developers who clearly have not run the available tests on their patches. Once a culture of regular testing sets in, it tends to become persistent

Toward better testing - March 26, 2014

- kselftest goal is to make things run quickly; it's a basic sanity test, not a full-scale stress test.

Kernel self tests - August 20, 2014

- Should developers expect all of the tests to pass, given that he has been seeing a lot of failures.
- Reporting of bugs is often slow, even when the existing tests catch them. that suggests that the tests are not being run that often.
- would be nice to have a mechanism to turn on all the configuration options needed to run a complete set of tests; there is no way to find out what those options are now.

Kernel testing - November 4, 2015

- New kernels are released regularly, but it is not entirely clear how much in-depth testing they are actually getting. Even the mainline kernel may not be getting enough of the right kind of testing
- The main problem is that it takes a lot of effort to analyze the bugs found with the tests
- LTP tests many things, but there is also plenty that it does not test.
- Some are running the latest self-tests with older kernels

Testing kernels - September 19, 2017

Key Takeaways:

- ➢ Not much of tests done while patches are pushed.
- ➢ Bug reporting is slow.
- ➢ Bug analyze takes long time.
- ➢ Era of Kselftest.

Source: https://lwn.net/Archives/ConferenceByYear/

TEST CONFERENCE FLASHBACK (2018 ONWARDS)

- Lot of kernel testing going on in various places, but not a lot of collaboration between those efforts
- The Linux Test Project has lots of tests, but many of those are never going to pass

A report from the Automated Testing Summit - November 14, 2018

One source code but different tests and framework approach.

- Make sure that patches have been at least minimally tested before spending time reviewing them

Filesystem test suites - June 13, 2018

Key Takeaways:

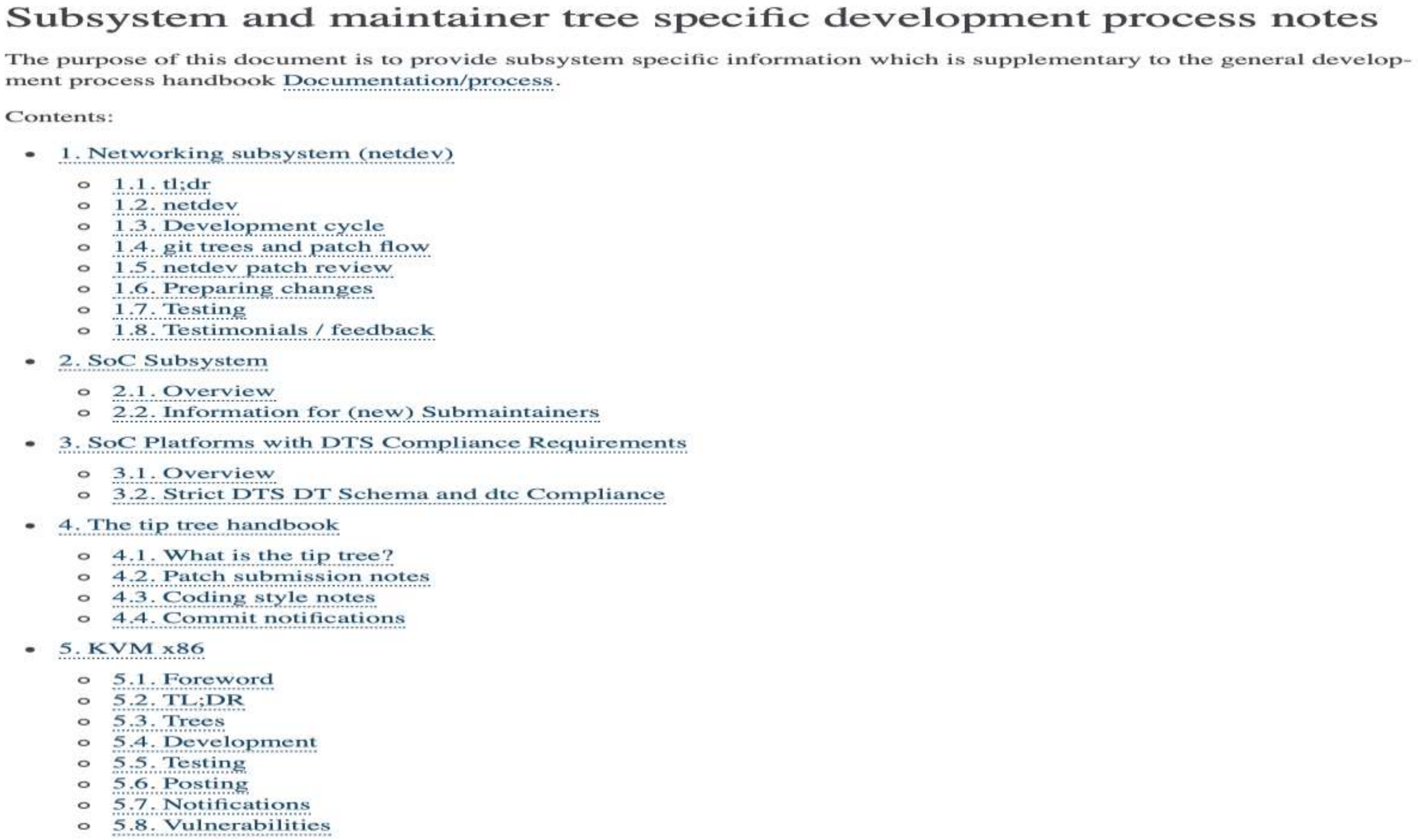
- ➢ Missing collaborations b/w teams
- ➢ Testing focused on code of interest.
- ➢ Large number of known test failures
- ➢ Bot reports huge number of issues – Are they all mustfix / e2e testing?
- ➢ Filesystem maintainers enforcing xfstests.
- ➢ Era of CI

- Different players are testing areas that they care about.
- syzbot has found 5,800 crashes by fuzzing the kernel; in doing so, it has only exercised around 7% of the kernel.

The 2019 Automated Testing Summit - November 13, 2019

Tools: kselftest, xfstests, LTP, Kunit, UML(user-mode Linux), Kernel Test framework (KFT), Linaro Linux kernel functional testing (LKFT) etc

Source: https://lwn.net/Archives/ConferenceByYear/

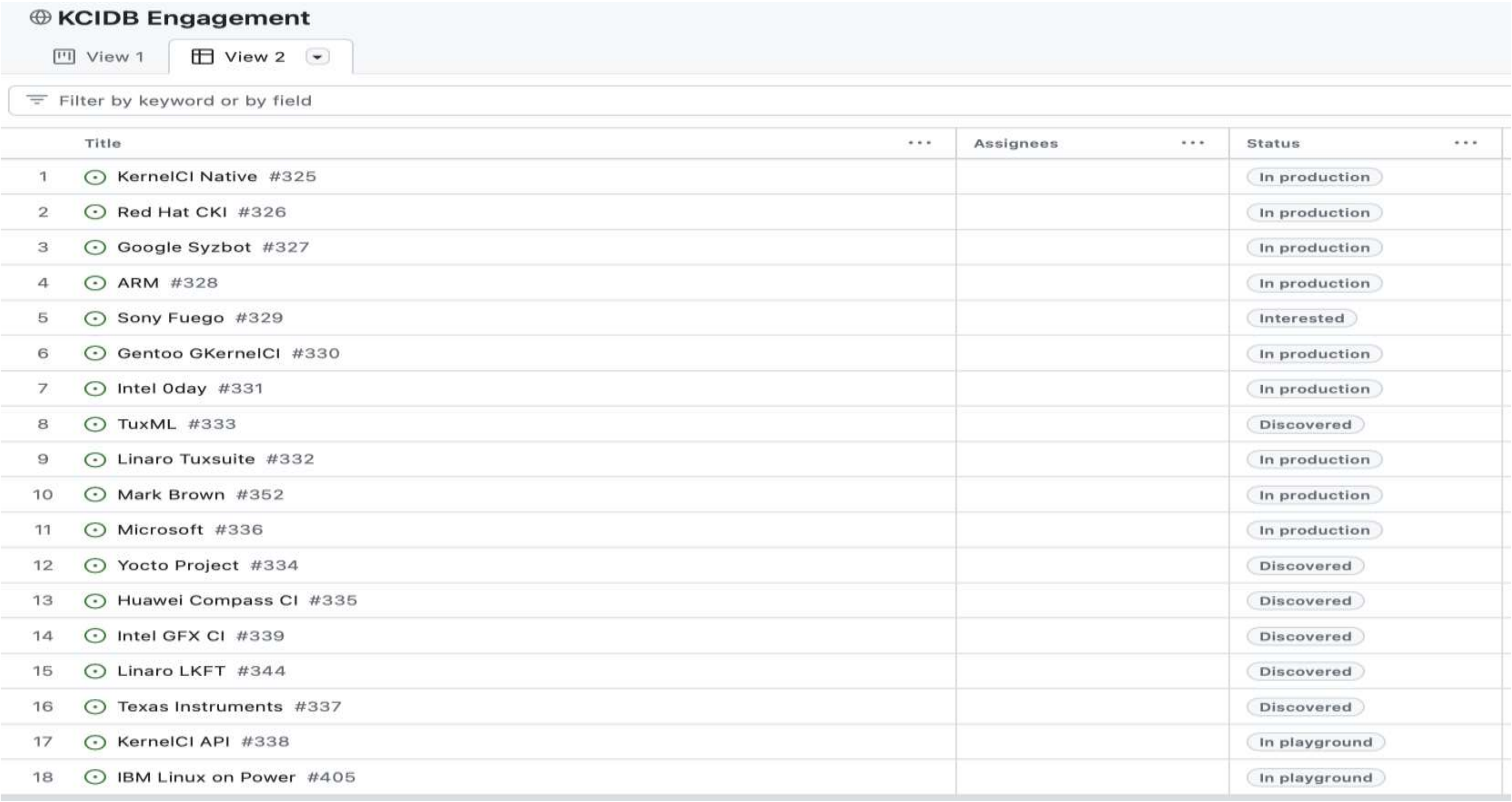


Subsystem and maintainer tree specific development process notes

The purpose of this document is to provide subsystem specific information which is supplementary to the general development process handbook Documentation/process.

Contents:

Source: https://docs.kernel.org/process/maintainer-handbooks.html#maintainer-handbooks-main



KCIDB Engagement

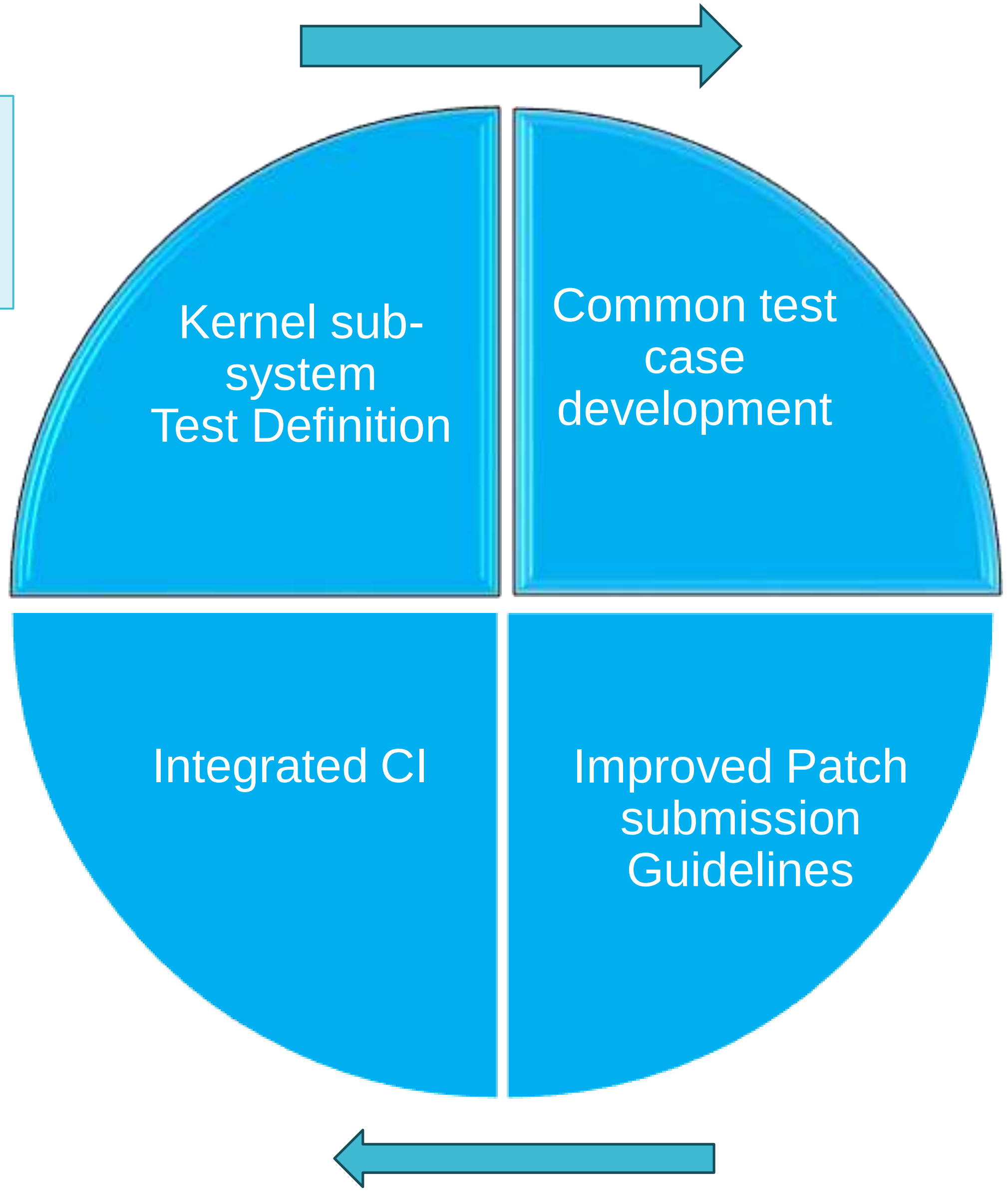
	Title	Assignees	Status
1	KernelCI Native #325		In production
2	Red Hat CKI #326		In production
3	Google Syzbot #327		In production
4	ARM #328		In production
5	Sony Fuego #329		Interested
6	Gentoo GKernelCI #330		In production
7	Intel 0day #331		In production
8	TuxML #333		Discovered
9	Linaro Tuxsuite #332		In production
10	Mark Brown #352		In production
11	Microsoft #336		In production
12	Yocto Project #334		Discovered
13	Huawei Compass CI #335		Discovered
14	Intel GFX CI #339		Discovered
15	Linaro LKFT #344		Discovered
16	Texas Instruments #337		Discovered
17	KernelCI API #338		In playground
18	IBM Linux on Power #405		In playground

Source: https://github.com/orgs/kernelci/projects/16/views/2

PROPOSAL

- Consensus upon **“Must have”** sanity test for each of the kernel subsystem.
- Functions / feature-based test tag.

- Focus on common test case development (Similar to Linux source code model)
- Feature/function driven test case within a sub-system to avoid duplicate tests / extreme condition tests.


Kernel sub-system Test Definition
Common test case development
Integrated CI
Improved Patch submission Guidelines

- Framework which covers agreed upon tests across Linux sub-system tests.
- Tests beyond build and boot.

Current emphasis on

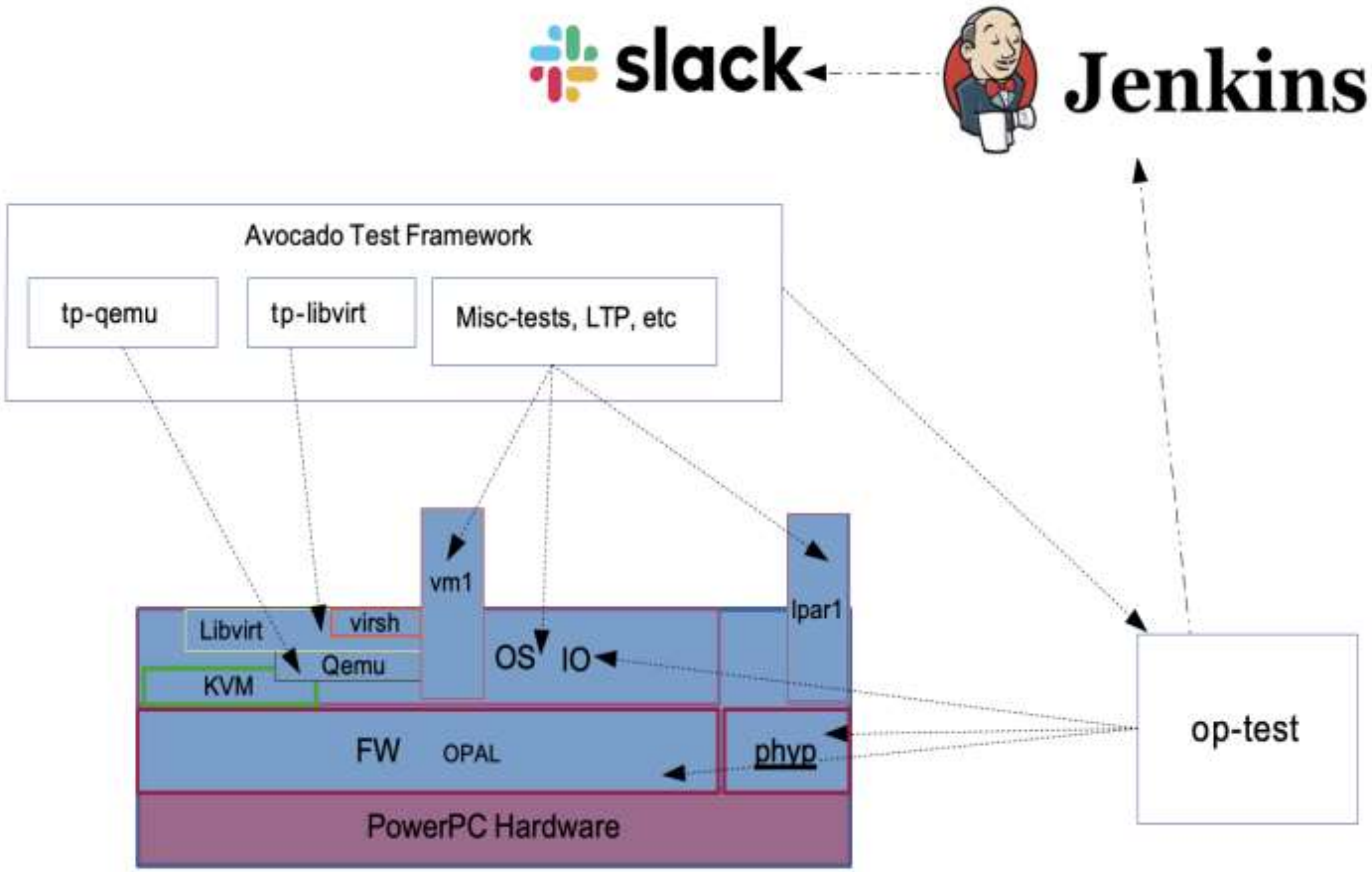
- Patch Summary
- Coding styles
- Reported by / Tested By tags
- regzbot – regression tracking

What’s missing?

- Compulsory add Unit test to cover the new patch / feature proposed?
- Attachment of test run logs for that specific sub-system.

AVOCADO FRAMEWORK

avocado-misc-tests https://github.com/avocado-framework-tests/avocado-misc-tests



- ❖ Support for OS, IO and KVM
- ❖ Wrapper capability to run kselftests, LTP etc.
- ❖ Test categorization to sanity , Regression bucket etc
- ❖ Yaml concept for different permutation.
- ❖ Framework capability to support Gcov & Dynamic test selection being worked.

IBM Red Hat AMD wistron BROADCOM

Legal Statement

- This work represents the view of the author and does not necessarily represent the view of IBM.
- IBM and IBM(logo) are trademarks or registered trademarks of International Business Machines Corporation in the United States and/or other countries.
- Linux is a registered trademark of Linus Torvalds
- Other company, product, and service names may be trademarks or service marks of others.

THANK YOU