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Display hardware testing with Chamelium

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Abstract

Hardware testing can help catch regressions in driver code. One way to test is to perform manual checks, however this is error-prone and doesn't scale. Another approach is to build an automatic test suite (e.g. IGT), which calls special driver interfaces or mocks resources to check whether they are doing the right thing (for instance, checksums to check that the right frame is produced).

However it's not possible to test all features with driver helpers: link training, hot-plug detection, DisplayPort Multi-Stream Transport and Display Screen Compression are examples of hard-to-test features. Moreover, some regressions can be missed because they happen at a lower level than the driver helpers.

For this reason, a board emulating a real screen has been developed: Chamelium. It can be used to test display features from the KMS client to the screen and make sure the whole software and hardware stack works properly. An overview of the Chamelium board features (and limitations) will be presented.

Outline

1. Why:
2. Automated testing is essential to merging patches with confidence
3. It's not possible to test all display-related features without real hardware
4. Some features can only be tested by adding knobs in the kernel (e.g. by forcing an EDID on a disconnected connector)
5. The tests aren't checking that the feature works correctly with a real screen
6. How:
7. Google has developed a Chamelium board that emulates a screen
8. Chamelium features
9. Chamelium support in IGT
10. Example of a Chamelium test (quick demo?)
11. Current limitations and possible improvements
12. Features supported by the receiver chips but not exposed by the Chamelium API
13. Features not supported (would require a new board)

Code of Conduct

Yes

GSoC, EVoC or Outreachy

No

Presenter: SER, Simon (sway/wlroots)

Session Classification: Main Track

Track Classification: Talk (half slot) (closed)