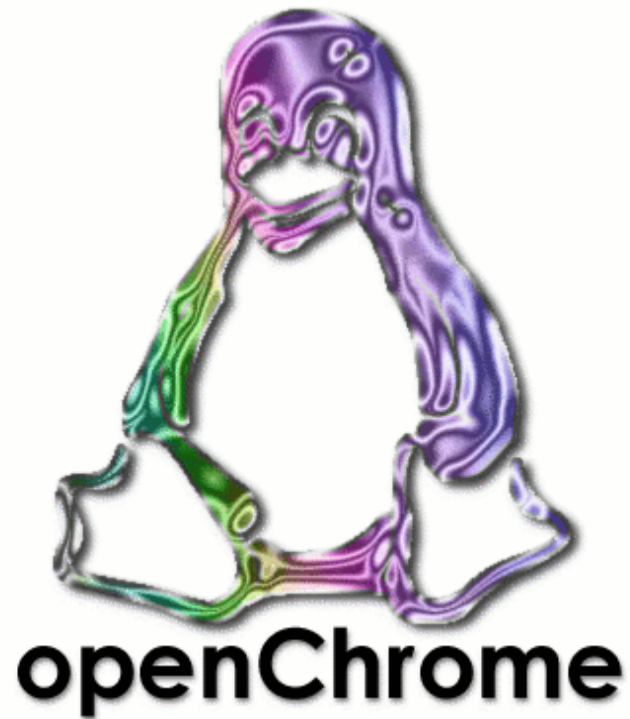


Update on OpenChrome Project



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OpenChrome DDX Current Status

- Lost interest in releasing Version 0.7, and it has been like that for more than 2 years (99% of OpenChrome development time is spent on OpenChrome DRM) since the last official release (Version 0.6)
- VGA connector detection code added during Version 0.7 development is less than reliable for P4M800 Pro, VX700, VX800, VX855, and VX900 chipsets (likely have to revert the code change)
- GPIO based I2C bus (we call it I2C bus 3) has issues obtaining EDID from a DVI connector (affects MSI Axis 700 Barebone)
- OpenChrome DRM now requires the use of OpenChrome DDX Version 0.7, so it has to be released eventually

OpenChrome DDX Version 0.7 Improvements

- Less display of messages during code compilation
- Stricter code build options are activated (finally)
- Use of strapping resistors to figure out FP (Flat Panel) configuration (helps with standby resume behavior) and other display resources (i.e., external DVI transmitter, external TV encoder) automatically
- VT (Virtual Terminal) now works after going through at least one standby resume cycle
- Fix to support X.Org X Server 1.20
- Special fixes to support VIA Embedded EPIA-M830 mainboard, VIA Embedded VE-900 mainboard, Samsung NC20 netbook, Quanta IL1 netbook (untested)
- Will seek out OpenChrome DRM (drivers/gpu/drm/openchrome/openchrome.ko) prior to looking for VIA DRM (drivers/gpu/drm/via/via.ko)

OpenChrome DRM Development Timeline Since XDC 2017

- Added standby resume support code (October 2017)
- Fixed runtime screen resolution crash bug (March 2018)
 - This turned out to be actually an OpenChrome DDX bug
- Added VIA Technologies VT1632(A) and Silicon Image Sil 164 DVI transmitters support (May 2018)
- Removed unfinished acceleration code (January 2019)
- Replaced the existing TTM memory allocator with a newly written one (March 2019)
- Converted to using primary plane for frame buffer (June 2019)
- Fixed hardware cursor sporadic corruption / OS non-boot bug with models other than HP 2133 mini-note (August 2019)

Essentially, OpenChrome DDX with OpenChrome DRM for KMS has achieved feature parity with OpenChrome DDX with UMS, except 2D rendering performance

OpenChrome DRM Development Progress Since August 2019

- Have been working on implementing cursor plane on and off since May 2019, but finally got it working on September 19th, 2019 (the code is not in the drm-openchrome upstream repository yet)
- Since universal plane is still considered “legacy” by DRM maintainers, started the conversion work to atomic mode setting (with the use of atomic mode setting transition helpers) right away
- Initial code is done (it took about a week), but OS is not booting due to `drm_connector_struct` related null pointer crash (obviously, aimed for getting atomic mode setting working before XDC 2019, but appears to have fallen short)
- Not sure what to do with **adjusted mode** since the “legacy” KMS code used it

Remaining OpenChrome DRM Issues Preventing Linux Kernel Mainline Inclusion

- Getting atomic mode setting working (a hard requirement)
- Frame buffer management issue (i.e., causes an eventual crash if screen resolution is changed too many times; appears to be a memory leak issue)
- Converting various function names from `via_*` to `openchrome_*` (optional)
- Other miscellaneous code refactoring (should not be too hard)

Future OpenChrome Project Plans

- Add KMS (Kernel Mode Setting) only DDX build option (should not be too hard)
- Add Command Submission (CS) based 2D (EXA) acceleration for all supported devices (i.e., CLE266 through VX900 chipsets)
- May have to wait for CS based 2D acceleration support to be added before allowing OpenChrome DRM to be compiled normally (i.e., need to hide OpenChrome DRM behind a compilation switch for a while)
- Add double buffering support
- Add video and 3D acceleration someday (long way off)
- Get DRM maintainers to drop old DRI1 based VIA DRM (optional)
- Port to xBSD (i.e., FreeBSD) (optional)

Conclusion

- OpenChrome DDX Version 0.7 will be released eventually, but the release date is still fluid
- OpenChrome DRM KMS code path has essentially achieved feature parity with OpenChrome DDX UMS code path only recently (this has always been the highest development priority for OpenChrome DRM)
- Added “legacy” universal plane support, but need to convert it to atomic mode setting before Linux mainline tree inclusion
- OpenChrome DRM is one of the very few community based KMS supported DRM to make it this far