

# Uncovering DRM's KUnit test coverage

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# Context

- Converting DRM selftests to KUnit
- Old tests + new tests

# KUnit + gcov




- Use KUnit script
- Limitations:
  - gcc version < 7
  - UML-only

```
[linux] ./tools/testing/kunit/kunit.py run --make_options=CC=/usr/bin/gcc6.5.0/bin/gcc \  
--kunitconfig=drivers/gpu/drm/tests --kconfig_add CONFIG_UML_PCI_OVER_VIRTIO=y \  
--kconfig_add CONFIG_VIRTIO_UML=y --kconfig_add CONFIG_DEBUG_KERNEL=y \  
--kconfig_add CONFIG_DEBUG_INFO=y --kconfig_add CONFIG_DEBUG_INFO_DWARF_TOOLCHAIN_DEFAULT=y \  
--kconfig_add CONFIG_GCOV=y
```

```
[linux] lcov -t "kunit_drm_tests" -o coverage.info -c -d .kunit/ \  
--gcov-tool=/usr/bin/gcc6.5.0/bin/gcov
```

```
[linux] genhtml -o /tmp/coverage_html coverage.info
```

# DRM helper functions

Directory	Line Coverage	Functions
<a href="#">drivers/gpu/drm</a>	 6.7 % 1034 / 15536	7.1 % 87 / 1234
<a href="#">drivers/gpu/drm/bridge</a>	 0.0 % 0 / 109	0.0 % 0 / 20
<a href="#">drivers/gpu/drm/display</a>	 4.7 % 167 / 3516	1.5 % 4 / 272
<a href="#">drivers/gpu/drm/lib</a>	 100.0 % 14 / 14	100.0 % 3 / 3

# DRM helper functions

```
24 : void drm_rect_rotate(struct drm_rect *r,  
:                       int width, int height,  
:                       unsigned int rotation)  
: {  
:     struct drm_rect tmp;  
:  
24 :     if (rotation & (DRM_MODE_REFLECT_X | DRM_MODE_REFLECT_Y)) {  
2 :         tmp = *r;  
:  
2 :         if (rotation & DRM_MODE_REFLECT_X) {  
2 :             r->x1 = width - tmp.x2;  
2 :             r->x2 = width - tmp.x1;  
:  
:  
2 :         if (rotation & DRM_MODE_REFLECT_Y) {  
0 :             r->y1 = height - tmp.y2;  
0 :             r->y2 = height - tmp.y1;  
:  
:  
:  
:  
24 :     switch (rotation & DRM_MODE_ROTATE_MASK) {  
:         case DRM_MODE_ROTATE_0:  
:             break;  
:  
:         case DRM_MODE_ROTATE_90:  
2 :             tmp = *r;  
2 :             r->x1 = tmp.y1;  
2 :             r->x2 = tmp.y2;  
2 :             r->y1 = width - tmp.x2;  
2 :             r->y2 = width - tmp.x1;  
2 :             break;
```

```
:         case DRM_MODE_ROTATE_180:  
0 :             tmp = *r;  
0 :             r->x1 = width - tmp.x2;  
0 :             r->x2 = width - tmp.x1;  
0 :             r->y1 = height - tmp.y2;  
0 :             r->y2 = height - tmp.y1;  
0 :             break;  
:  
:         case DRM_MODE_ROTATE_270:  
0 :             tmp = *r;  
0 :             r->x1 = height - tmp.y2;  
0 :             r->x2 = height - tmp.y1;  
0 :             r->y1 = tmp.x1;  
0 :             r->y2 = tmp.x2;  
0 :             break;  
:  
:         default:  
:             break;  
:  
:  
24 : }
```

# AMD's Display Driver

## LCOV - code coverage report




Current view: [top level](#) - drivers/gpu/drm/amd/display/dc

Test: coverage.info

Date: 2022-08-30 20:32:10

	Hit	Total	Coverage
Lines:	37	673	5.5 %
Functions:	1	58	1.7 %

Filename	Line Coverage	Functions
<a href="#">dc_dmub_srv.c</a>	 10.9 %	37 / 340 4.0 %
<a href="#">dc_edid_parser.c</a>	 0.0 %	0 / 18 0.0 %
<a href="#">dc_helper.c</a>	 0.0 %	0 / 295 0.0 %
<a href="#">dc_link.h</a>	 0.0 %	0 / 14 0.0 %
<a href="#">dm_services.h</a>	 0.0 %	0 / 6 0.0 %

Directory	Line Coverage	Functions
<a href="#">drivers/gpu/drm/amd/display/dc/dml</a>	 5.3 %	83 / 1567 4.0 %
<a href="#">drivers/gpu/drm/amd/display/dc/dml/calcs</a>	 1.7 %	74 / 4278 15.9 %
<a href="#">drivers/gpu/drm/amd/display/dc/dml/dcn20</a>	 2.9 %	219 / 7554 9.3 %

