

DRM HW Composer for Beagle x15 Board

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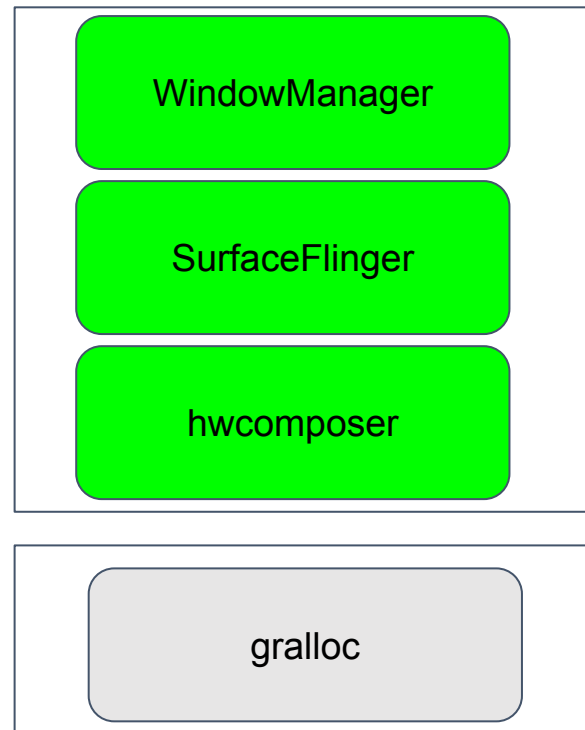
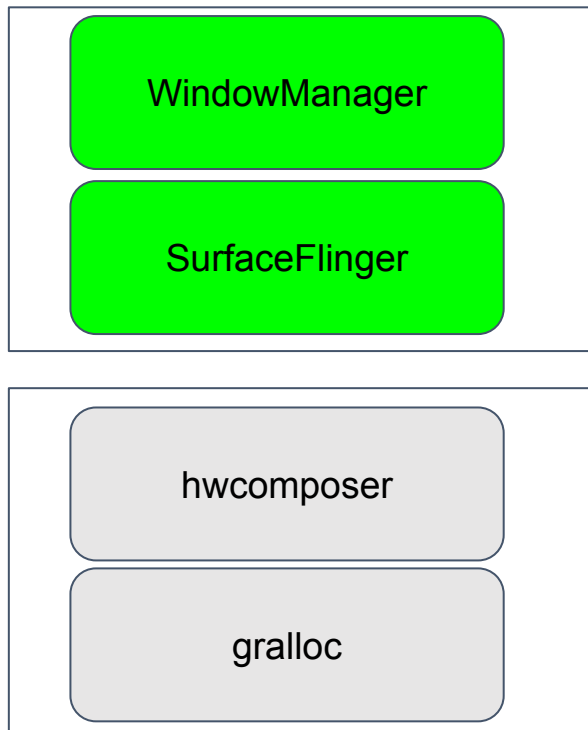


Linaro
connect
Bangkok 2019

What is that about?

- ❑ Why do we do this and what are we trying to achieve
- ❑ The initial device configuration
- ❑ Enable the external/drm_hwcomposer to be launched on the board
- ❑ Implement the buffer Importer
- ❑ Problems and solutions

What is the goal?

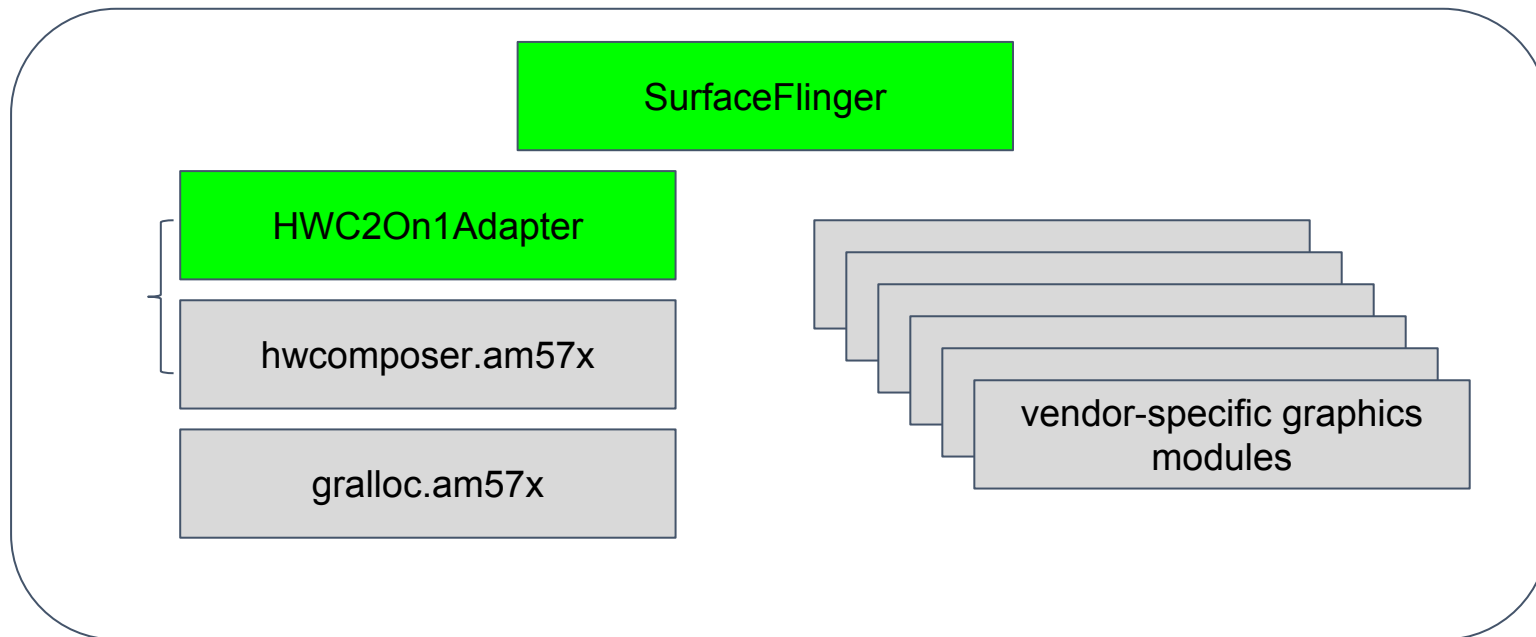


The initial configuration

Android Q

Beagle x15 Board

Kernel 4.14



Launch the drm hwc on the board

```
03-21 13:47:11.889 220 220 E HWComposer: presentAndGetReleaseFences: present failed for display 0: NoResources (6)
03-21 13:47:11.905 212 212 E hwc-platform-drm-generic: could not create drm fb -22
03-21 13:47:11.905 212 212 E hwc-drm-two: Failed to import layer, ret=-22
03-21 13:47:11.905 220 220 E HWComposer: presentAndGetReleaseFences: present failed for display 0: NoResources (6)
03-21 13:47:11.920 212 212 E hwc-platform-drm-generic: Cannot convert hal format to drm format 2816
03-21 13:47:11.920 212 212 E hwc-platform-drm-generic: Cannot convert hal format 4294967274 to bpp (returning 32)
03-21 13:47:11.920 212 212 E hwc-platform-drm-generic: could not create drm fb -22
03-21 13:47:11.920 212 212 E hwc-drm-two: Failed to import layer, ret=-22
03-21 13:47:11.921 212 212 E hwc-platform-drm-generic: Cannot convert hal format to drm format 6656
03-21 13:47:11.921 212 212 E hwc-platform-drm-generic: Cannot convert hal format 4294967274 to bpp (returning 32)
03-21 13:47:11.921 212 212 E hwc-platform-drm-generic: could not create drm fb -22
03-21 13:47:11.921 212 212 E hwc-drm-two: Failed to import layer, ret=-22
03-21 13:47:11.921 220 220 E HWComposer: presentAndGetReleaseFences: present failed for display 0: NoResources (6)
03-21 13:47:11.937 212 212 E hwc-platform-drm-generic: Cannot convert hal format to drm format 2816
03-21 13:47:11.937 212 212 E hwc-platform-drm-generic: Cannot convert hal format 4294967274 to bpp (returning 32)
03-21 13:47:11.937 212 212 E hwc-platform-drm-generic: could not create drm fb -22
03-21 13:47:11.937 212 212 E hwc-drm-two: Failed to import layer, ret=-22
03-21 13:47:11.938 212 212 E hwc-platform-drm-generic: Cannot convert hal format to drm format 6656
```

Add the buffer Importer class implementation

The Importer structure in **external/drm_hwcomposer**:

platform.h }
platform.cpp } class **Importer** (pure virtual base class)

platformdrmgeneric.h }
platformdrmgeneric.cpp } class **DrmGenericImporter** : public **Importer**

platformhisi.h }
platformhisi.cpp } class **HisiImporter** : public **DrmGenericImporter**

platformminigbm.h }
platformminigbm.cpp } class **DrmMinigbmImporter** : public **DrmGenericImporter**

Add the buffer Importer class implementation

external/drm_hwcomposer/platformdrmgeneric.h:

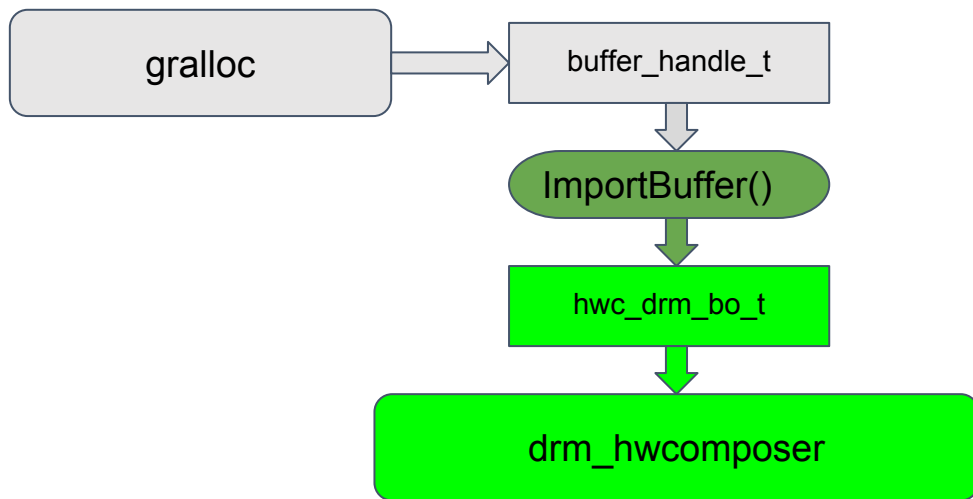
```
class DrmGenericImporter : public Importer {
public:
    DrmGenericImporter(DrmDevice *drm);
    ~DrmGenericImporter() override;
    int Init();
    int ImportBuffer(buffer_handle_t handle, hwc_drm_bo_t *bo) override;
    int ReleaseBuffer(hwc_drm_bo_t *bo) override;
    bool CanImportBuffer(buffer_handle_t handle) override;
    uint32_t ConvertHalFormatToDrm(uint32_t hal_format);
    uint32_t DrmFormatToBitsPerPixel(uint32_t drm_format);

private:
    DrmDevice *drm_;
    const gralloc_module_t *gralloc_;
};
```

Implemented in the **platformdrmgeneric.cpp**

Add the buffer Importer class implementation

The `int ImportBuffer(buffer_handle_t handle, hwc_drm_bo_t *bo)` function converts `buffer_handle_t` to the `hwc_drm_bo_t`:



Add the buffer Importer class implementation

```
external/drm_hwcomposer/Android.mk:
```

```
ifeq ($(TARGET_PRODUCT),hikey960)
```

```
LOCAL_CPPFLAGS += -DUSE_HISI_IMPORTER
```

```
LOCAL_SRC_FILES += platformhisi.cpp
```

```
LOCAL_C_INCLUDES += device/linaro/hikey/gralloc960/
```

```
else ifeq ($(TARGET_PRODUCT),hikey)
```

```
LOCAL_CPPFLAGS += -DUSE_HISI_IMPORTER
```

```
LOCAL_SRC_FILES += platformhisi.cpp
```

```
LOCAL_C_INCLUDES += device/linaro/hikey/gralloc/
```

```
else ifeq ($(strip $(BOARD_DRM_HWCOMPOSER_BUFFER_IMPORTER)),minigbm)
```

```
LOCAL_SRC_FILES += platformminigbm.cpp
```

```
LOCAL_C_INCLUDES += external/minigbm/cros_gralloc/
```

```
else
```

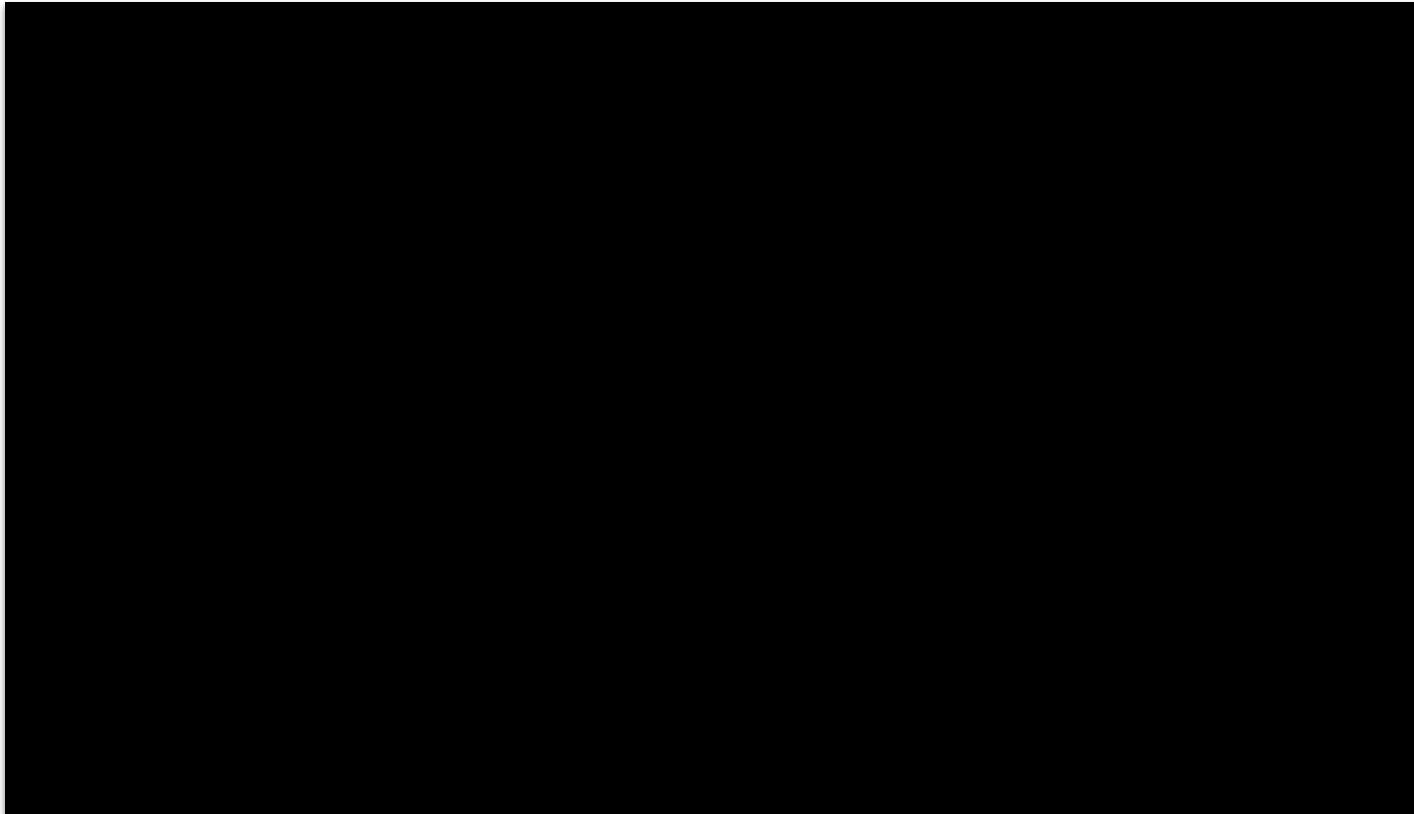
```
LOCAL_CPPFLAGS += -DUSE_DRM_GENERIC_IMPORTER
```

```
endif
```

Add the buffer Importer class implementation

```
diff --git a/Android.mk b/Android.mk
index d5ee200..d4907d1 100644
--- a/Android.mk
+++ b/Android.mk
@@ -90,6 +90,9 @@ ifeq ($(TARGET_PRODUCT),hikey960)
 LOCAL_CPPFLAGS += -DUSE_HISI_IMPORTER
 LOCAL_SRC_FILES += platformhisi.cpp
 LOCAL_C_INCLUDES += device/linaro/hikey/gralloc960/
+else ifeq ($(TARGET_PRODUCT),beagle_x15)
+LOCAL_C_INCLUDES += hardware/ti/am57x/gralloc/include/
+LOCAL_SRC_FILES += platformimagination.cpp
 else ifeq ($(TARGET_PRODUCT),hikey)
 LOCAL_CPPFLAGS += -DUSE_HISI_IMPORTER
 LOCAL_SRC_FILES += platformhisi.cpp
```

Possible problems



**Image
bouncing on
HDMI display.**

Captured in slow motion.

Cause:

Interlaced mode is used by Android after probing the display.

Solution:

Delist interlaced modes if not needed. Under investigation.

Possible problems

A display is not working as a primary display.

Possible cause: the display type is not supported as internal or external display in dem_hwc.

How to check: the drmconnector.cpp file contains the DrmConnector class. The function internal() an external() are containing supported display types. If your display type is not in the list - it won't work.

Solution: add required display type to the list of supported, regarding the display role.

Possible problems

Single display is not working as an external display.

Possible cause: under investigation

Solution: under investigation

Questions?