DRM MSM Display and Graphics Update

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MSM Display upstream driver timeline

Originally authored by Rob and Archit Taneja and maintained by Rob Clark since then

sc7180, sc7280

Chrome with DP/eDP/writeback support

Massive driver supporting multiple chipsets with a rich feature set , bug tracking and IGT-based CI merge process (thank you Rob, Collabora, Linaro and upstream community)

sdm845 Chrome

(DPU driver landed upstream . Thank you Sean Paul !)

Delayed push and inflection point

Android market domination with major SOC vendors having own kernels

Business reasons - no major android programs with pure upstream kernel

Time to market / product cycles of mobile SOCs

Chrome program major inflection point to land new DPU driver

Why Upstream push now?

| Continued support for Compute programs | Support for Open platforms | Android GKI | Carry on the good work ! |

QC's upstream driver strategy
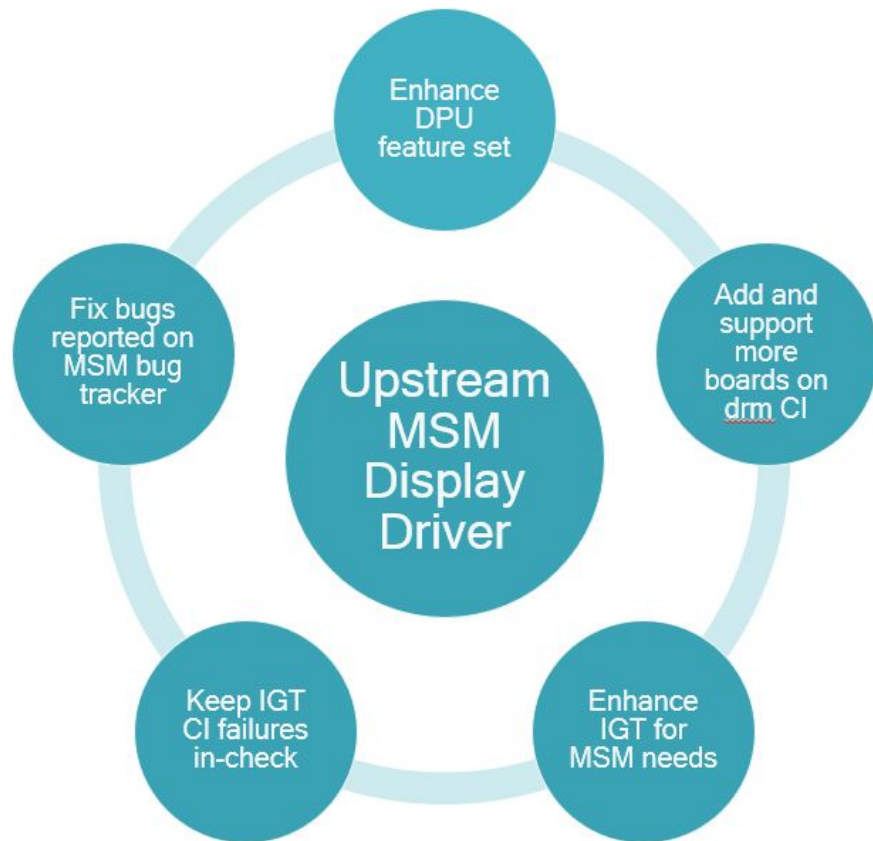
GPU status

- ~30 models of adreno supported, back to a2xx
  - a730 and a740 landing in v6.7
- devcoredump for gpu hang and fault debugging
  - Crash telemetry useful for long-tail issues
- drm_gpu_scheduler for job scheduling
- Full GEM eviction support
  - CrOS leans heavily on zram for low RAM devices
- Recent work:
  - Userspace iova allocation
  - Lockdep vs runpm/icc/pmqos vs fence signalling annotation
  - Submit ioctl overhead opts (v6.6)
- Future work:
  - Userptr (discontiguous)
  - vm_bind?

DRM CI

Platform support

mdp4: legacy

- 3.12   only MSM8x60 / APQ8064 are supported

mdp5: maintenance mostly

- 3.14   3 (msm8974, two kinds, apq8084)
- 4.1   4 (msm8916)
- 4.2   5 (msm8994)
- 4.4   6 (msm8996)
- 5.0   7 (msm8917)
- 5.4   8 (msm8998)
- 5.5   9 (msm8976)
- 5.8   10 (msm8936)
- 5.9   12 (sdm660, sdm630)
- 5.16   13 (msm8953)
- 6.5   14 (msm8226)

Platform support

DPU, newer driver for new platforms

- 4.19   1 (sdm845)
- 5.6   2 (sc7180)
- 5.13   5 (sc7280, sm8150, sm8250)
- 5.18   8 (msm8998*, qcm2290, sc8180x)
- 6.2   9 (sm6115)
- 6.3   13 (sc8280xp, sm8350, sm8450, sm8550)
- 6.5   15 (sm6350, sm6375)
- 6.6-rc   16 (sm6125)
- pending:
  - sm7150, sdm670, sdm660* / sdm630*
  - msm8996* / msm8937 / msm8917* / msm8953* (experimental support, WIP)
  - patches for new platform at the announcement day

(*) - migration from the MDP5 driver

Current features

- DSI
  - normal and bonded, command and video
- DP/eDP
  - 0 failures in CTS (PHY, Link and Test Pattern using IGT)
- HDMI
- Full drm_bridge / drm_bridge_connector chains
  - except apq8064 LVDS
- CTM support (no gamma/degamma yet)
- Writeback support (depending on the platform)
- eDP PSR support (disabled by default)
- DSC 1.1 / 1.2 support (depends on platform, DSI-only, DP is pending)
  - Driving force behind DSC panels support
- Devcoredump for DPU

Upcoming display features from QC

- Color pipeline for HDR displays
- Concurrent writeback support
- DP MST
- Command mode - Video mode switch for MIPI DSI panels
- Simulation panel framework for MIPI DSI panels
- YUV output over DP
- DSC over DP

Upcoming features continued

- Virtualized DRM planes
- DSI: proper handling of link power up
- DP: USB-C uABI design and implementation
- Blending improvements (more planes, less bandwidth)

Development stats (next-20231013)

- 3352 non-merge commits
- 288 contributors
- Largest contributing parties (> 20 commits)
  - Qualcomm, 900 commits
  - Linaro, 756 commits
  - Google / Chromium, 543 commits
  - Intel, 114 commits
  - SoMainline (*), 111 commits
  - Jonathan Marek, 60 commits
  - SuSE, 43 commits
  - Huawei, 42 commits
  - Collabora, 24 commits

(*) community project

Questions?