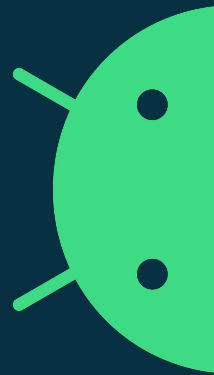


# Android Baseline 2021 Profile

Simplifying Vulkan Development on Android

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# Bottom Line Up Front

- **Blog post:**
  - [developer.android.com/ndk/guides/graphics/android-baseline-profile](https://developer.android.com/ndk/guides/graphics/android-baseline-profile)
- **The Android Baseline 2021 profile is public in JSON format:**
  - [github.com/KhronosGroup/Vulkan-Profiles/blob/master/profiles/VP\\_ANDROID\\_baseline\\_2021.json](https://github.com/KhronosGroup/Vulkan-Profiles/blob/master/profiles/VP_ANDROID_baseline_2021.json)
- **Will be publishing support numbers to Android dashboard:**
  - [developer.android.com/about/dashboards](https://developer.android.com/about/dashboards)

# Application Developer Pain Point

- **Goal: Simplify application development**
  - **There are 180+ extensions that exist across Vulkan**
- **Today: An application must query multiple “capabilities”:**
  - **Extensions**
  - **Features**
  - **Limits**
  - **Formats**
- **Acutely felt by mobile developers**
  - **Wide range of capabilities across devices**
- **This is somewhat simplified by Vulkan version numbers**
  - **Anything "core" to version will not need to be individually queried**
  - **Meaning a developer will likely need to query version and `_less_` of above**
  - **The release of Vulkan 1.3 makes this the simplest it's been since 1.0**

# Android Baseline 2021 Profile (ABP)

- **Goal: make it easy for developers to create an application that supports the vast majority of currently active Android devices**
  - **Multiple Android releases**
  - **Range of older-to-newer, lower-to-higher-end devices**
- **Initial ABP proposal created using available metrics**
- **Refined with feedback from Khronos partners**
- **Needs to be available to developers without updating devices**
- **[github.com/KhronosGroup/Vulkan-Profiles/blob/master/profiles/VP\\_ANDROID\\_baseline\\_2021.json](https://github.com/KhronosGroup/Vulkan-Profiles/blob/master/profiles/VP_ANDROID_baseline_2021.json)**

# ABP 2021 Requirements (Subset)

- **Minimum Vulkan version number: 1.0.68**
- **Compressed textures through** `ASTC` **and** `ETC`
- **Variable colorspace through** `VK_EXT_swapchain_colorspace`
- **Sample shading and multisample interpolation through** `sampleRateShading`
- **Update the swapchain in parts with** `VK_KHR_incremental_present`
- **Shader pointers into uniforms, storage buffs with** `VK_KHR_variable_pointers`
  
- **Dozens of limits**
  - `maxFramebufferWidth/Height/Layers`
  - `maxImageDimension*`
  - `maxBoundDescriptorSets`
  - `maxComputeWorkGroupInvocations, maxComputeWorkGroupSize`
  
- **Dozens of formats**

# ABP 2021 Support in the Wild

- Vulkan Profiles is an SDK-side change
  - If a device currently has the required Vulkan support, this device should already support the ABP and no over-the-air update will be necessary
- We expect the vast majority of Android devices currently in use to support ABP
- Will be broadcasting the percentage of Android support at
  - [developer.android.com/about/dashboards](https://developer.android.com/about/dashboards)
  - Plan to have this live around the time of SDK release

# The Future of ABP

- **Committed to a 2022 refresh of the profile later this year**
- **We will continue to work with Khronos partners**
- **If you're an Android developer and have an opinion on Android Baseline profile**
  - **We want to know what extensions, features, etc. you'd like to see added**
  - **We will be reaching back out shortly for feedback**
- **Considering differentiating between different form-factors (e.g. phones, wearables, TV, auto)**
  - **Form factors very different**
  - **Hardware very similar**
- **No concrete plans beyond a 2022 refresh**
  - **We'll likely update when we have demand from ISVs or IHVs**
  - **Think every other year or so**