What is Cuttlefish?

- Android Virtual Device used by kernel, systems, and BSP devs across the Android Ecosystem to help develop pre-silicon hardware, kernel software, or test various different android configurations
Why should you use it?

- Virtio compliant
  - GPU, SND, Input, Net, Wifi (mac80211_hwsim), Block, pmem
  - QEMU, CrosVM, Gem5, COQOS (OpenSynergy)
- ADB, WebRTC, serial
- GDB! Or printk ;)
- Used to test upstream Linux
  - Android Common Kernel’s CI/CD pipeline
- AArch64, AArch32, x86, x86_64
  - GCE, AWS, w/ or w/o GPU, Ampere Boxes, Rockpi, Emulation
- Bootloader support (U-Boot) + Bootconfig
- Developed upstream (AOSP)
Getting Started
Install our host packages

- cuttlefish-base (and recommended cuttlefish-user) - [https://github.com/google/android-cuttlefish](https://github.com/google/android-cuttlefish)

**Android Build**

```
$ mkdir android && cd android
$ repo init -u https://android.googlesource.com/platform/manifest -b master
$ repo sync -j
$ source build/envsetup.sh; lunch aosp_cf_x86_64_phone-userdebug
$ m -j
```

**Kernel + Module Builds**

```
$ mkdir kernel && cd kernel
$ repo init -u https://android.googlesource.com/kernel/manifest -b \ common-android-mainline // or common-android14-5.15
$ repo sync -j
$ tools/bazel run //common:kernel_x86_64_dist \ $ tools/bazel run //common-modules/virtual-device:virtual_device_x86_64_dist
```
Launch/Interact w/ the device

$ launch_cvd -kernel_path /path/to/bzImage\n   -initramfs_path /path/to/kernel/module/ramdisk\n$ adb shell\n$ tail -f ~/cuttlefish_runtime/kernel.log // dmesg
> Go to https://127.0.0.1:8443/

GDB the kernel

$ launch_cvd -kernel_path /path/to/bzImage\n   -initramfs_path /path/to/kernel/module/ramdisk \n   -gdb_port 1234 -cpus=1 \n   -extra_kernel_cmdline nokaslr\n$ gdb vmlinux\n(gdb) target remote :1234\n(gdb) hbreak start_kernel\n(gdb) c
Future

- EFI Boot
- EROFS
- Run Cuttlefish on Phones (or on Cuttlefish)
- Automotive Virtio SCMI
- Virtio RPMB
- ARM64 GPU
- Virtio GPIO
- Camera, Video Encode/Decode (no acceleration atm)
cloud-android-ext@google.com - Feature requests are welcome!

https://source.android.com/docs/setup/create/cuttlefish - for more information
Thank You! Questions?
Common Questions

Why cuttlefish?

- Upstream kernels/qemu
- Mostly upstream u-boot
- Easily instrumentable (gdb, kgdb)

Range of Kernels Supported

- android[13|12L|12]-gsi - Easily boot android11-5.4 and upwards
- android[11|10]-gsi - can boot prior kernels