

Kernel Hacking with Cuttlefish

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Agenda

What is cuttlefish?

Basic setup

Future

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What is cuttlefish?

- Android Virtual Device (AVD) based on QEMU
x86_64 architecture, uses `-machine pc-i440fx-2.8`, KVM support
- Runs locally, or on the Google Cloud Platform
Utilizes nested virtualization features for high performance
- Mostly virtio based (block, net, serial, gpu)
Also uses virtual SoC driver `drivers/staging/android/vsoc.c`, but we are working to remove it
- Kernel `defconfig` to enable virtio/vsoc/android features
- Not to be confused with Android Emulator, goldfish/ranchu
No `goldfish_pipe`, `goldfish_address_space`
- Developed upstream: AOSP, mainline Linux
(The `virt_wifi` driver is pending review on net-next)

Basic setup

Build the platform:

```
$ mkdir android && cd android
$ repo init -u https://android.googlesource.com/platform/manifest
$ . build/envsetup.sh
$ lunch aosp_cf_x86_phone-userdebug
$ make -j128 dist
```

Build the kernel:

```
$ mkdir kernel && cd kernel
$ git clone https://android.googlesource.com/kernel/common \
    -b android-4.14 # or, android-mainline-tracking
$ cd common
$ ARCH=x86_64 make x86_64_cuttlefish_defconfig
$ make -j128
```

Launch the platform:

```
$ launch_cvd \  
  -kernel_path \  
  $PWD/kernel/common/arch/x86/boot/bzImage
```

Connect ADB:

```
$ adb shell
```

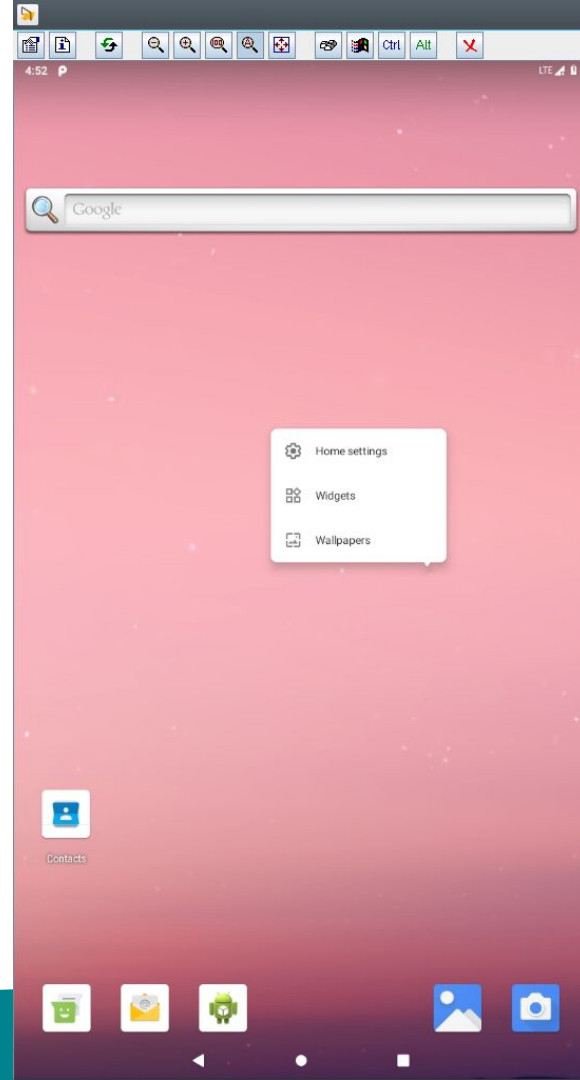
Connect VNC:

```
$ java -jar tightvnc-jviewer.jar  
  127.0.0.1 port 6444
```

Useful logs:

```
~/cuttlefish_runtime/kernel.log
```

```
~/cuttlefish_runtime/logcat
```



Future

android

Future

- Documentation on android.com
- Eliminate the VSoC driver, replace with virtio
- Use `virtio_gpu_3d` to accelerate graphics
- Cuttlefish build and kernel defconfig for arm64 (WIP)

Feedback welcome!

THANK YOU