

# Release Note of Ubuntu Minimal 20.04 LTS (v1.0)

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## Summary

Release Date	2020-10-15
Release Type	Update

File name : ubuntu-20.04-4.9-minimal-odroid-**c4-hc4**-20201015.img.xz

## Download from below servers

- Official US West Coast: [https://odroid.in/ubuntu\\_20.04lts](https://odroid.in/ubuntu_20.04lts)
- Official US East Coast: [https://east.us.odroid.in/ubuntu\\_20.04lts](https://east.us.odroid.in/ubuntu_20.04lts) (Thanks to David Beauchamp @ archlinuxarm)
- Official EU Germany: [https://de.eu.odroid.in/?directory=.%2Fubuntu\\_20.04lts%2F](https://de.eu.odroid.in/?directory=.%2Fubuntu_20.04lts%2F)
- Official Korea/Asia Mirror: <https://dn.odroid.com/S905X3/ODROID-C4/Ubuntu/>

## Features

- **Linux Kernel LTS 4.9.236**
- The latest Ubuntu 20.04
- Mali GPU driver for framebuffer(fbdev): OpenGL-ES 1.1, 2.0, 3.0, 3.1 and 3.2 with OpenCL-1.2 and 2.0.
- A lot of [Kernel patches](#)



The RootFS Auto-resize feature has changed!!!  
No need for power cycling, resize will happen on background in the first booting process.

## Known issues and Tips

- Tons of issues undocumented. 🙄
- 4K video playback is problematic due to audio issues.
- [How to Overclock and Underclock](#)

## Access Credentials

Username	Password
root	odroid

## PPSSPP

- Install PPSSPP for PSP emulation, source code will be on the same folder:

target

```
/root/install_ppsspp.sh
cd /root/ppsspp
./PPSSPPSDL
```

## glmark2-es2-fbdev

- A slightly modified version was required to work
- Source code is on /root/glmark2-es2-fbdev-master
- You can launch it running:

target

```
glmark2-es2-fbdev
```

## OpenCL configuration

- Run the following commands to start an OpenCL programming.

target

```
sudo apt purge mali-fbdev
sudo apt install clinfo ocl-icd-libopencl1
cd ~
apt download mali-fbdev
ar -xv mali-fbdev_*
tar -xvf data.tar.xz
rm usr/lib/aarch64-linux-gnu/lib0OpenCL.so*
sudo cp -r usr/* /usr/
mkdir -p /etc/OpenCL/vendors/
echo libmali.so | sudo tee /etc/OpenCL/vendors/mali.icd
rm ~/control.tar.xz ~/data.tar.xz ~/debian-binary ~/mali-
```

```
fbdev_0.1-2_arm64.deb
rm -r ~/etc ~/usr
```

target

```
root@odroid:~# clinfo

Number of platforms 1
  Platform Name      ARM Platform
  Platform Vendor    ARM
  Platform Version   OpenCL 2.0
git.c8adbf9.ad00b04c1b60847de257177231dc1a53
  Platform Profile   FULL_PROFILE
  Platform Extensions
cl_khr_global_int32_base_atomics cl_khr_global_int32_extended_atomics
cl_khr_local_int32_base_atomics cl_khr_local_int32_extended_atomics
cl_khr_byte_addressable_store cl_khr_3d_image_writes
cl_khr_int64_base_atomics cl_khr_int64_extended_atomics cl_khr_fp16
cl_khr_icd cl_khr_egl_image cl_khr_image2d_from_buffer
cl_khr_depth_images cl_khr_create_command_queue cl_arm_core_id
cl_arm_printf cl_arm_thread_limit_hint
cl_arm_non_uniform_work_group_size cl_arm_import_memory
cl_arm_shared_virtual_memory
  Platform Extensions function suffix      ARM

  Platform Name      ARM Platform
Number of devices 1
  Device Name        Mali-G31
  Device Vendor      ARM
  Device Vendor ID   0x70930000
  Device Version     OpenCL 2.0
git.c8adbf9.ad00b04c1b60847de257177231dc1a53
  Driver Version     2.0
  Device OpenCL C Version OpenCL C 2.0
git.c8adbf9.ad00b04c1b60847de257177231dc1a53
  Device Type        GPU
  Device Profile     FULL_PROFILE
  Device Available   Yes
  Compiler Available Yes
  Linker Available   Yes
  Max compute units  1
  Max clock frequency 750MHz
  Device Partition   (core)
    Max number of sub-devices 0
    Supported partition types  None
    Supported affinity domains (n/a)
  Max work item dimensions 3
  Max work item sizes 256x256x256
  Max work group size 256
  Preferred work group size multiple 4
```

Preferred / native vector sizes	
char	16 / 4
short	8 / 2
int	4 / 1
long	2 / 1
half	8 / 2
(cl_khr_fp16)	
float	4 / 1
double	0 / 0
(n/a)	
Half-precision Floating-point support	(cl_khr_fp16)
Denormals	Yes
Infinity and NaNs	Yes
Round to nearest	Yes
Round to zero	Yes
Round to infinity	Yes
IEEE754-2008 fused multiply-add	Yes
Support is emulated in software	No
Single-precision Floating-point support	(core)
Denormals	Yes
Infinity and NaNs	Yes
Round to nearest	Yes
Round to zero	Yes
Round to infinity	Yes
IEEE754-2008 fused multiply-add	Yes
Support is emulated in software	No
Correctly-rounded divide and sqrt operations	No
Double-precision Floating-point support	(n/a)
Address bits	64, Little-Endian
Global memory size	3886776320 (3.62GiB)
Error Correction support	No
Max memory allocation	971694080 (926.7MiB)
Unified memory for Host and Device	Yes
Shared Virtual Memory (SVM) capabilities	(core)
Coarse-grained buffer sharing	Yes
Fine-grained buffer sharing	No
Fine-grained system sharing	No
Atomics	No
Shared Virtual Memory (SVM) capabilities (ARM)	
Coarse-grained buffer sharing	Yes
Fine-grained buffer sharing	No
Fine-grained system sharing	No
Atomics	No
Minimum alignment for any data type	128 bytes
Alignment of base address	1024 bits (128 bytes)
Preferred alignment for atomics	
SVM	0 bytes
Global	0 bytes
Local	0 bytes
Max size for global variable	65536 (64KiB)

```

Preferred total size of global vars                0
Global Memory cache type                          Read/Write
Global Memory cache size                          65536 (64KiB)
Global Memory cache line size                     64 bytes
Image support                                        Yes
  Max number of samplers per kernel                 16
  Max size for 1D images from buffer                 65536 pixels
  Max 1D or 2D image array size                    2048 images
  Base address alignment for 2D image buffers       32 bytes
  Pitch alignment for 2D image buffers              64 pixels
  Max 2D image size                                 65536x65536 pixels
  Max 3D image size                                 65536x65536x65536
pixels
  Max number of read image args                     128
  Max number of write image args                    64
  Max number of read/write image args                64
Max number of pipe args                             16
Max active pipe reservations                         1
Max pipe packet size                               1024
Local memory type                                  Global
Local memory size                                  32768 (32KiB)
Max number of constant args                         8
Max constant buffer size                           65536 (64KiB)
Max size of kernel argument                        1024
Queue properties (on host)
  Out-of-order execution                            Yes
  Profiling                                          Yes
Queue properties (on device)
  Out-of-order execution                            Yes
  Profiling                                          Yes
  Preferred size                                    2097152 (2MiB)
  Max size                                           16777216 (16MiB)
Max queues on device                                1
Max events on device                                1024
Prefer user sync for interop                        No
Profiling timer resolution                          1000ns
Execution capabilities
  Run OpenCL kernels                                Yes
  Run native kernels                                No
printf() buffer size                             1048576 (1024KiB)
Built-in kernels                                    (n/a)
Device Extensions
cl_khr_global_int32_base_atomics cl_khr_global_int32_extended_atomics
cl_khr_local_int32_base_atomics cl_khr_local_int32_extended_atomics
cl_khr_byte_addressable_store cl_khr_3d_image_writes
cl_khr_int64_base_atomics cl_khr_int64_extended_atomics cl_khr_fp16
cl_khr_icd cl_khr_egl_image cl_khr_image2d_from_buffer
cl_khr_depth_images cl_khr_create_command_queue cl_arm_core_id
cl_arm_printf cl_arm_thread_limit_hint
cl_arm_non_uniform_work_group_size cl_arm_import_memory
cl_arm_shared_virtual_memory

```

```
NULL platform behavior
  clGetPlatformInfo(NULL, CL_PLATFORM_NAME, ...) ARM Platform
  clGetDeviceIDs(NULL, CL_DEVICE_TYPE_ALL, ...) Success [ARM]
  clCreateContext(NULL, ...) [default] Success [ARM]
  clCreateContextFromType(NULL, CL_DEVICE_TYPE_DEFAULT) Success (1)
    Platform Name ARM Platform
    Device Name Mali-G31
  clCreateContextFromType(NULL, CL_DEVICE_TYPE_CPU) No devices found
in platform
  clCreateContextFromType(NULL, CL_DEVICE_TYPE_GPU) Success (1)
    Platform Name ARM Platform
    Device Name Mali-G31
  clCreateContextFromType(NULL, CL_DEVICE_TYPE_ACCELERATOR) No devices
found in platform
  clCreateContextFromType(NULL, CL_DEVICE_TYPE_CUSTOM) No devices
found in platform
  clCreateContextFromType(NULL, CL_DEVICE_TYPE_ALL) Success (1)
    Platform Name ARM Platform
    Device Name Mali-G31

ICD loader properties
  ICD loader Name OpenCL ICD Loader
  ICD loader Vendor OCL Icd free software
  ICD loader Version 2.2.11
  ICD loader Profile OpenCL 2.1
```

## Video Playback

- Hardware accelerated 4K video playback is possible using kplayer
- **Before installing the aml-libs package, you must update system.**

target

```
apt update
apt full-upgrade
```

- Installing aml-libs package.

target

```
apt install aml-libs
reboot
```

- Reinstall it even if it is already installed. (Just in case)

## target

```
apt reinstall aml-libs
reboot
```

- kplayer usage:

## target

```
kplayer filename
```

- audio out can be set in the /etc/asound.conf file.

```
pcm.!default{
    type hw
    card 0
    device 0
}

ctl.!default{
    type hw
    card 0
}
```

## boot.ini

- [Available here](#)

## Kernel build (native)

- [Native Kernel build Guide](#)

## How to Update system and kernel software

### target

```
sudo apt update
sudo apt full-upgrade
sudo reboot
```

From:  
<https://wiki.odroid.com/> - **ODROID Wiki**

Permanent link:  
[https://wiki.odroid.com/odroid-hc4/os\\_images/ubuntu/minimal/20201015](https://wiki.odroid.com/odroid-hc4/os_images/ubuntu/minimal/20201015)

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