

DRAM Clock Adjustment

1. [Brief DDR spec. of ODROID-C2 and available DDR clock sets](#)
2. [Update Guide \(1\) for Ubuntu](#)
3. [Update Guide \(2\) for Android](#)
4. [How to confirm bl1 boot of the new DDR clock has been updated well](#)

1. Brief DDR spec. of ODROID-C2 and available DDR clock sets

- The DDR parts of C2 support max DDR3-1866 (CL - tRCD - tRP : 13-13-13) and the limit of max DDR clock is 933MHz based on DDR part spec.
- Existing DDR clock and timing : 912MHz (912×2=1824) / 13-13-13

Here are the available DDR clock sets you can test:

DDR Clock	CL - tRCD - tRP
1104 MHz	14-14-14
912 MHz	13-13-13
792 MHz	11-11-11
408 MHz	7-7-7

Max ddr clock based on DDR parts of C2 is 933MHz.

So, when you run the DDR clock at 1104MHz, system stability can be unstable depending on ddr parts of each board, because of its over-clocking value, so 1104MHz is not guaranteed for system stability.

2. Update Guide (1) for Ubuntu

This section is for Ubuntu. First, download **c2_update_ddrclk.sh** to your root filesystem.

```
$ wget https://dn.odroid.com/S905/BootLoader/ODROID-C2/c2_update_ddrclk.sh
$ chmod +x ./c2_update_ddrclk.sh
```

The usage of c2_update_ddrclk.sh is as follows:

```
Usage : ./c2_update_ddrclk.sh < DDR_CLK (1104 | 912 | 792 | 408) >
```

After updating, you must run **reboot** the system.

```
$ ./c2_update_ddrclk.sh 1104
$ reboot
```

c2_update_ddrclk.sh

Here is c2_update_ddrclk.sh.

[c2_update_ddrclk.sh](#)

```
#!/bin/sh
#
# Copyright (C) 2016 Hardkernel Co.,. Ltd
# Joy Cho <joy.cho@hardkernel.com>
#
# SPDX-License-Identifier:      GPL-2.0+
#
# update ddr clock for Ubuntu
#

if [ -z $1 ]; then
    echo "Usage ./c2_update_ddrclk.sh <DDR_CLK (1104 | 912 | 792 | 408)>"
    exit 1
fi

if [ $1 != 1104 -a $1 != 912 -a $1 != 792 -a $1 != 408 ]; then
    echo "Wrong DDRCLK! Usage ./c2_update_ddrclk.sh <DDR_CLK (1104 | 912 | 792 | 408)>"
    exit 1
fi

DDRCLK=$1

b11=/tmp/b11.bin.hardkernel.$DDRCLK
tmp=/tmp/temp.bin

##### 1. check the current DDR clock #####
dd if=/dev/mmcblk0 of=$tmp bs=1 count=2 skip=43530 status=none
CUR_DDRCLK=$(hexdump -e "%d" $tmp)

if [ $DDRCLK -eq $CUR_DDRCLK ]; then
    echo "current ddr clk is already set as $DDRCLK MHz"
    exit 1
fi

echo "existing DDR clk is $CUR_DDRCLK"

##### 2. download b11 binary from dn server #####
wget -P /tmp/ https://dn.odroid.com/S905/BootLoader/ODROID-C2/b11.bin.hardkernel.$DDRCLK
if [ ! -f $b11 ];then
    echo "error: b11 binary doesn't exist"
```

```
        exit 1
fi

dd if=$b11 of=/dev/mmcblk0 bs=1 count=442 status=none
dd if=$b11 of=/dev/mmcblk0 bs=512 skip=1 seek=1 status=none

echo "Update done!"

##### 3. check the updated DDR clock #####
echo "Now let's check if update has been completed..."

dd if=/dev/mmcblk0 of=$tmp bs=1 count=2 skip=43530 status=none

CUR_DDRCLK=$(hexdump -e "%d" $tmp)
echo "updated DDR clk is $CUR_DDRCLK"

if [ $DDRCLK != $CUR_DDRCLK ]; then
    echo "updating DDR clock FAIL!! Expected : $DDRCLK, Updated :
$CUR_DDRCLK"
else
    echo "updating DDR clock has been completed!!!"
fi

rm $b11
rm $tmp
```

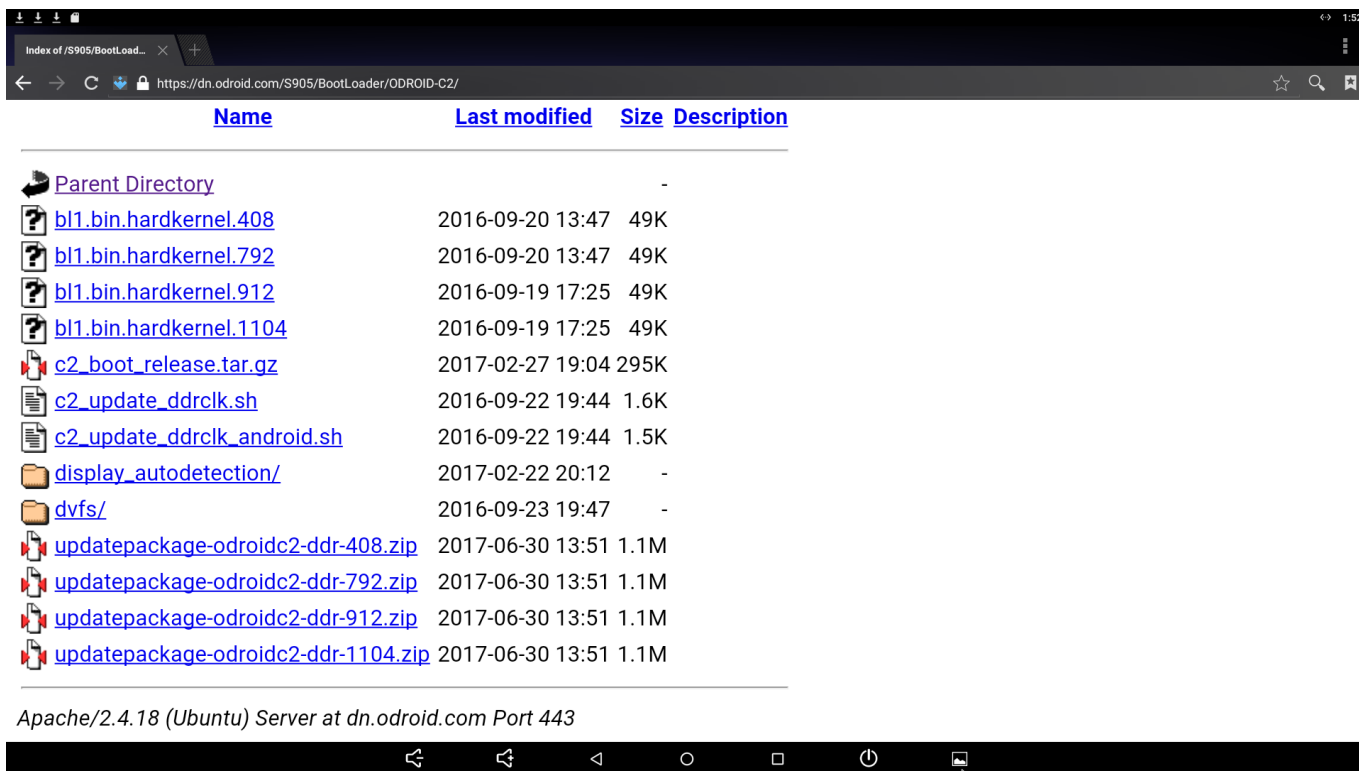
3. Update Guide (2) for Android

This section is for Android.

Run Browser

open <https://dn.odroid.com/S905/BootLoader/ODROID-C2/>

Last update: 2017/08/01 01:35
odroid-c2:application_note:software:adjust_dram_clock http://wiki.odroid.com/odroid-c2/application_note/software/adjust_dram_clock



Download files

[updatepackage-odroidc2-ddr-408\[792/912/1104\].zip](#)

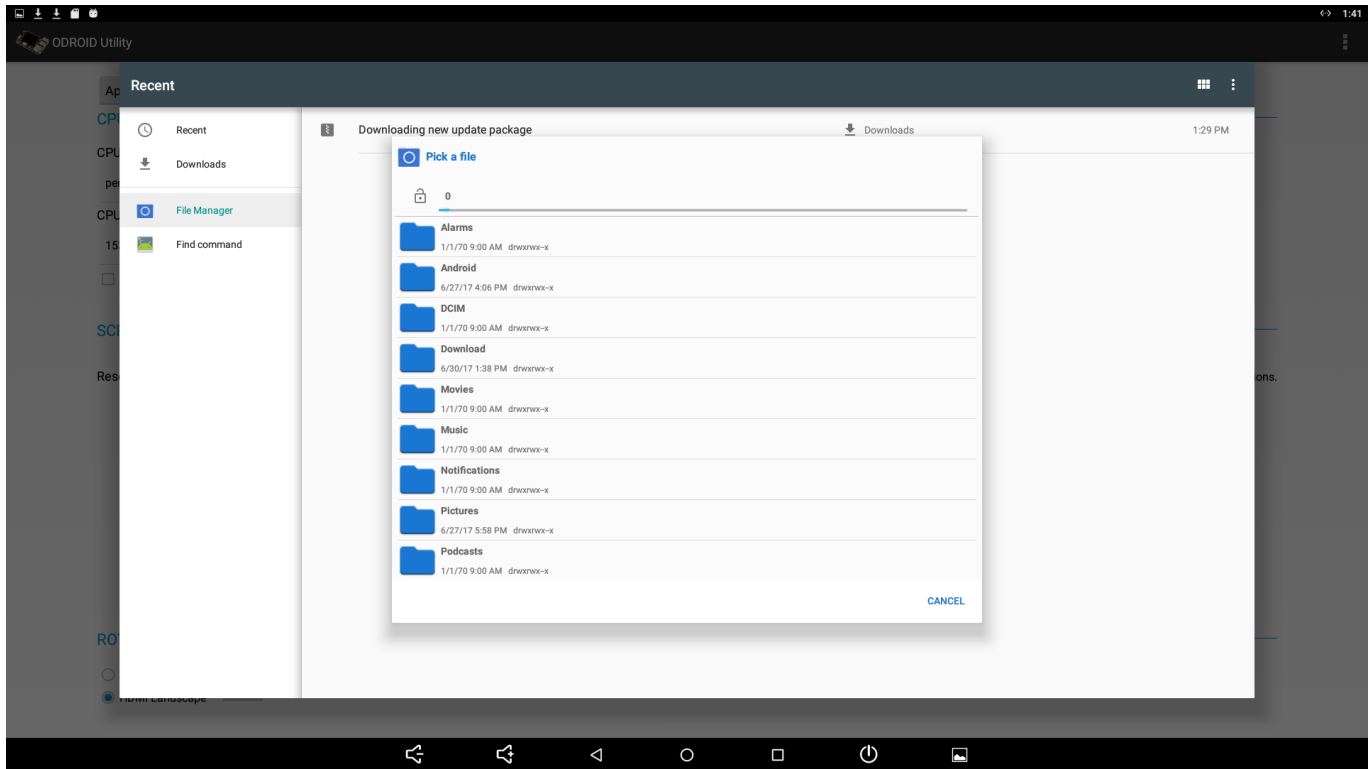
Run ODROID Utility app

Click menu and Select "Package install from storage"

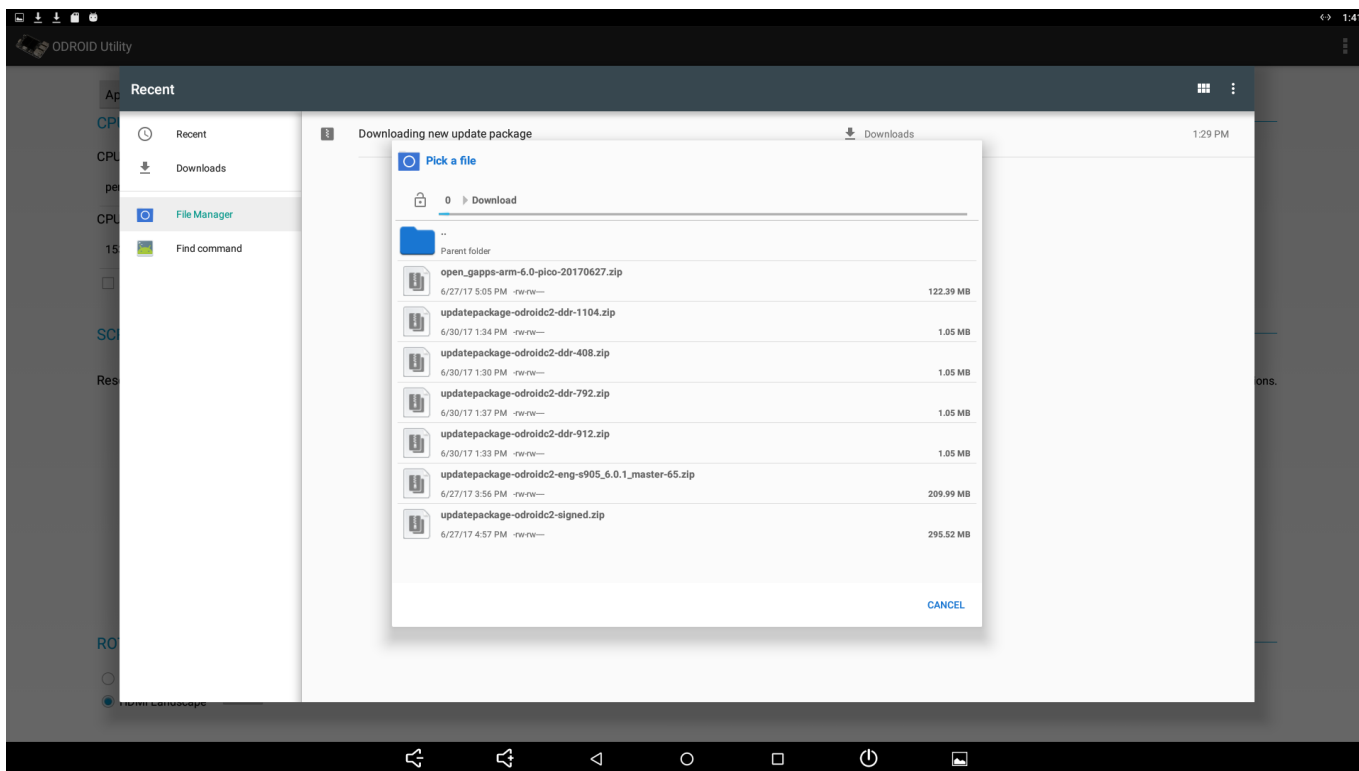


Select "File Manager"

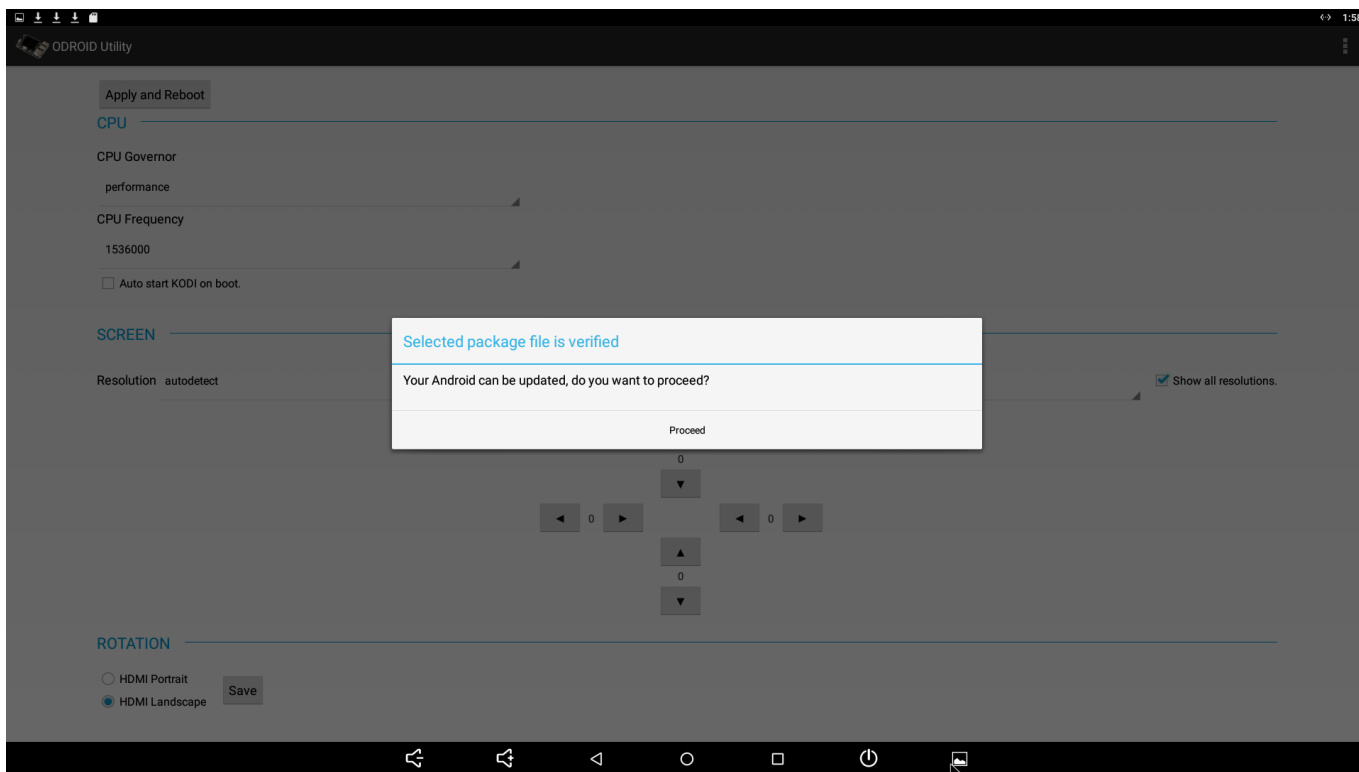
Open "Download" folder.



Select updatepackage-odroidc2-ddr-xxx.zip wanted DDR clock



Process "recovery"



4. How to confirm bl1 boot with the new DDR clock has been updated well

Wht the output message while updating with `c2_update_ddrclk.sh`, you can confirm if update is done

with the new DDR clock you choose as following.

```
$ ./c2_update_ddrclk.sh 1104  
  
existing DDR clk is 912 <<<-----  
.....  
.....  
Update done!  
Now let's check if update has been completed...  
updated DDR clk is 1104 <<<-----  
updating DDR clock has been completed!!!
```

After reboot, you can check the DDR configuration using the following logs of boot loader if you have a usb-uart module kit.

```
BL2 Built : 11:44:26, Nov 25 2015.  
Board ID = 8  
set vcck to 1100 mv  
set vddee to 1070 mv  
CPU clk: 1536MHz  
DDR channel setting: DDR0 Rank0+1 same  
DDR0: 2048MB(auto) @ 912MHz(2T)-13
```

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

Permanent link:
http://wiki.odroid.com/odroid-c2/application_note/software/adjust_dram_clock

Last update: **2017/08/01 01:35**

