



## Application Notes

# Amlogic Update USB Tool User Guide Revision 1.0

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## Revision History

Version	Date	Author	Modify log
1.0	2017-01-22	Sam Wu	First released version

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## 1. Main functions overview of update tool

Amlogic USB update tool is a command line program, with Windows version and Linux version. The usage of this tool is like fastboot, which can upgrade partition mirrors in PC command line. In addition, command sets of this tool is more rich than fastboot protocol.

Update tool use protocol called WorldCup Device to talk with Amlogic board. Lite version WorldCup device protocol is built in Amlogic SOC, so you can boot Amlogic SOC from USB cable using Update tool.

Any u-boot supported commands can be sent using Update tool when board is in u-boot burning mode.

### 1.1 Mainly Related Terminology

Step 1. update.exe:

Windows version of the update tool, it's command line mode so need be called at Windows' shell cmd.exe.

Step 2. Aml\_usb\_update\_tool\_4\_ubuntu.zip:

Linux version of this update tool, only 64-bit binary is provided, can be called at Ubuntu shell terminal.

Step 3. WorldCup Device:

It's USB device protocol used by update tool to communicate with Amlogic Board, which is in usb burning mode.

Like fastboot protocol, update tool can work only when there is a WorldCup device in PC device manager.

Step 4. aml\_image\_v2\_packer:

Amlogic tool to pack partition images to a burning package, usually called aml\_upgrade\_package.img.

Only image packed by this tool aml\_image\_v2\_packer in Ubuntu (or AmlImagePack.exe in Windows) can be used by Amlogic Factory burning tool.

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## 1.2 Helping usage of this update tool

```
E:\workspace\tools_gits\usb_update\Release>update
====>Amlogic update USB tool(Ver 1.0) 2017/01<=====
update <command> [device name] <arg0> <arg1> <arg2> ...

Common Commands:
update <partition>: Burn a partition with a partition image
update <mwrite> : Burn data to media or memory
update <mread> : Dump a data from media or memory to pc and save as a file
update <tplcmd> : like bulkcmd
update <bulkcmd> : pass and exec a command platform bootloader can support
update <write> : Down a file to memory
update <run> : Run code from memory address
update <read> : Dump data from memory:

Common Commands format:
update partition partName imgFilePath [imgFileFmt] [shalVerifyFile]
e.g.— update partition boot z:\a\b\boot.img [normal] //format normal is optional
e.g.— update partition system z:\xxxx\system.img [sparse] //format sparse is optional
e.g.— update partition upgrade z:\xxxx\upgrade.ubifs ubifs //format ubifs is MANDATORY

update bulkcmd "burning cmd or u-boot cmd"
e.g.— update bulkcmd "disk_intial 0" //cmd to init flash for usb burning
e.g.— update bulkcmd "printenv" //uboot command 'printenv'

update mread store/mem partName/memAddress
e.g.— update mread store boot normal 0x200000 doot.dump //upload 32M of boot partition in path doot.dump
e.g.— update mread mem 0x1080000 normal d:mem_2M.dump //upload 2M memory at address 0x1080000 in path d:mem_2M.dump
====>Amlogic update USB tool(Ver 1.0) 2017/01<=====
```

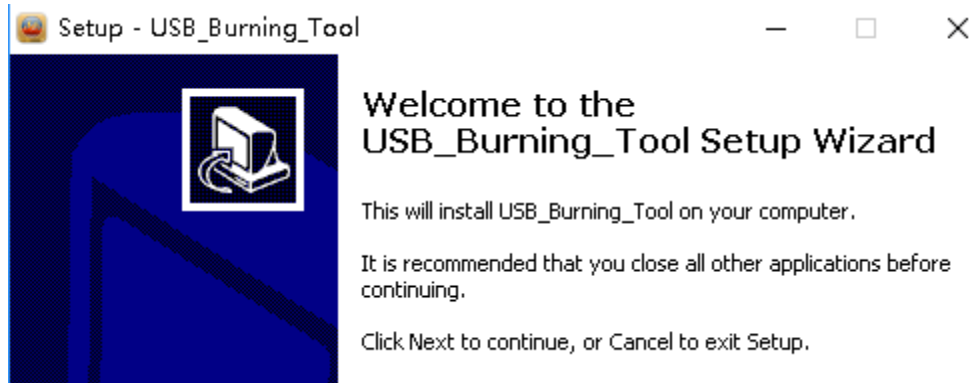
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## 2. Install and check the WorldCup device USB driver

The first step to use this update tool is to check the USB cable, and make sure the Worldcup driver is correctly installed.

### 2.1 Install the driver in Windows PC

Usually Amlogic will not provide single driver installed of WorldCup\_ driver, and you can install this driver by installing the USB Burning Tool.



Each USB port need loading USB device driver when first connecting to a unused device. For win7 and above, the OS will auto load the WorldCup device driver if you succeed in installing the USB\_BURNing\_Tool. If your Amlogic based board in usb burning is connected to PC already, but the Windows' Device Manager does not automatically load the device driver (One reason is that you use the XP system), you can manually perform the driver installation, for example in my computer--D:\Program Files (x86)\Amlogic\USB\_Burning\_Tool\WorldCup\_Device\InstallDriver.exe.

### 2.2 Install the driver in Ubuntu PC

Take the 'Ubuntu 12.04.4 64-bits LTS' as an example.

Step 1. Add the Ubuntu user to access worldcup device without root authority.

in the path /etc/udev/rules.d, create a '70-persistent-usb.rules' and edit like this:

```
SUBSYSTEMS=="usb",ATTRS{idVendor}=="1b8e",ATTRS{idProduct}=="c003",OWNER="yourUserName",MODE="0666",SYMLINK+="worldcup"
```

- a> You can refer this rule from the attachment file '70-persistent-usb.rules', and Make attention to change 'yourUserName' to the real user name, in my Ubuntu it is 'amlogic'.
- b> for other version of Ubuntu, please refer how to create a udev rules for usb device from Web.
- c> restart you udev server to valid you rule: 'sudo udevadm control --reload-rules'.

Step 2. Enter usb burning mode:

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Connect the usb otg cable between Ubuntu pc and Amlogic platform, input 'update' in uboot terminal, and you enter the usb burning mode.

!! You should see '*InUsbBurn*' in uboot command, and now you enter usb burning mode.

Step 3. Install the libusb driver:

In your Ubuntu pc, use '*lsusb*' to see whether the Ubuntu is already installed the libusb library.

a> If you see device like this: 'ID 1b8e:c003 Amlogic. Inc.', Now you PC already can use the 'update' tool.

b> If you fail to see Amlogic worldcup device string '1b8e:c003...', you can install it use command 'sudo apt-get install libusb-dev'

c> check driver installed ok:

Make sure plug-out and plugin the usb cable to let worldcup usb device probed by Ubuntu:

> use 'lsusb' to see if Amlogic device '1b8e:c003...' recognized.

> In Ubuntu 12.04, a device called '*/dev/worldcup*' as described in you udev rules.

## 2.3 Check the driver installed ok

Step 1. To install the Worldcup usb device driver followed by Chapter 2.1 or 2.2

Step 2. If you see the following tips at serial output, you successful in the usb burning mode.

a> if your amlogic board is empty, which means no bootlader in flash,

Make sure your amlogic board is connected pc, then use update tool to check the board status

*\$ update.exe identify*

*AmlUsbIdentifyHost*

*This firmware version is x-x-0-0*

The above shows you now in Amlogic Worldcup usb mode, and 'x' means variable value.

b> if your amlogic board is In UBOOT terminal, should see this output info which shows Worldcup device is enumerated ok by PC.

```
[MSG]sof
Set Addr 3
Get DT cfg
Get DT cfg
Get DT cfg
Get DT cfg
Get DT cfg
Get DT cfg
set CFG
```

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## 3. Examples of Common used commands

### 3.1 Program single partition

#### 3.1.1 initialize flash

If your Amlogic based board is booting from flash and not need to change partition table, you can skip this step. Or we need initialize flash before programming flash logic partitions.

Step 1: Download dtb.img before flash init.

If your sdk is above 3.14, then you need download dtb.img for flash initialization, as flash driver need parsing partition tabel configure from dts.

You can skip this step in 2 cases:

case 1: your sdk is <3.10, i.e, usually m8/m8 SOC, and the part table already in spl.

case 2: you sdk is >=3.14 and there is already dtb existing in flash, then if you don't need updating dtb and don't need erasing flash, u can also skip this step.

usage: `update mwrite d:/dtb.img mem dtb normal`

Step 2: initialize the flash

usage: `update bulkcmd "disk_initial 0"`

Note: if you need erasing flash at the same time , replace 1 with 0.

#### 3.1.2 flashing a partition image

.Command Tips	Command example
Flashing boot partition using partition image in path d:\boot.img	<code>update partition boot D:/boot.img</code>
flashing system partition using partition image d:\system.img	<code>update partition system D:/system.img</code>
Flashing u-boot.bin to bootloader partiton	<code>Update partition bootloader u-boot.bin</code>
Flashing ubifs image upgrade.img to part upgrade	<code>Update partition upgrade upgrade.img ubifs</code>

#### 3.2 Send any u-boot command

.Command Tips	Command example
Restore defaulted u-boot env in 32-bits platform which earlier than gxbb	<code>Update bulkcmd "defenv; save; reset"</code>
Restore defaulted u-boot env in 64-bits platform	<code>Update bulkcmd "env default -a; save; reset"</code>

#### 3.3 updating dtb.img in normal flash

As the dtb.img is not located in logical partition, and at the same time to not confuse you, there is no encapsulated command to burn the dtb.img. i.e, 2 steps to burn burn dtb.img like "fatload + store".



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## 3.3.1 Commonly way to upgrading dtb

Step 1. Download dtb.img to memory

usage: *update mwrite z:\xxx\p200\dtb.img mem 0x1080000 normal*

Step 2. Using flash command to updating the dtb.img

usage: *update bulkcmd "store dtb write 0x1080000"*

## 3.3.2 Newly way to upgrading dtb

If your uboot code is the latest version, try this combined command to upgrading dtb.

usage: *update partition\_aml\_dtb z:/xxx/dtb.img*

## 3.4 DUMP data to PC

### 3.4.1 Dump memory

e.g. dump 8MBytes memory from addr 0x1010000, and saved in path d:\mem.dump.

usage: *update mread mem 0x1010000 normal 0x800000 d:\mem.dump*

### 3.4.2 Dump flash partition data

e.g. dump first 8MBytes data of logic partition logo, and saved as d:\logo.dump.

usage: *update mread store logo normal 0x800000 d:\logo.dump*

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## 4. Booting empty flash from pc

Usually, If your flash is empty, you are advised to flashing the entire code package 'aml\_upgrade\_package.img' using USB\_Burning\_Tool. The following tips is for developers who debugging SPL/TPL.

### 4.1 For MX4.4/M8/M8B/G9TV

#### 4.1.1 To boot non-decompressed uboot, use the following commands

```
a> update cwr ddr_init.bin 0xd9000000 //download ddr_init.bin use usb control write command
b>update run 0xd9000030 //run the ddr_init.bin to init DDR/pll
c>update write u-boot-orig.bin 0x10000000 //download origin uboot to it's compiled TEXT_BASE
d> update run 0x10000000 //run the uboot
```

#### 4.1.2 To boot decompressed version uboot, use the following commands

```
a>update cwr ddr_init.bin 0xd9000000 //download ddr_init.bin use usb control write command
b>update run 0xd9000030 //run the ddr_init.bin to init DDR/pll
c>update write u-boot-comp.bin 0x400000 //download decompressed tpl to address 0x400000
d>update write decompressPara_4M.dump 0xd9010000 //Download the para to tell ddr_init.bin to decompress ucl-
decompressed uboot from 0x400000 (Get this .dump file from from Attached file list of this wiki)
e>update run 0xd9000030 //run the ddr_init.bin again to decompress the TPL
f>update run 0x10000000 //run the uboot
```

#### 4.1.3 To boot secureos version uboot which compiled using macro, use the following commands

```
a>update cwr ddr_init.bin 0xd9000000 //download ddr_init.bin use usb control write command
b>update run 0xd9000030 //run the ddr_init.bin to init DDR/pll
c>update write uboot-secureos.bin 0x400000 //download decompressed tpl to address 0x400000
d>update write decompressPara_4M.dump 0xd9010000 //Download the para to tell ddr_init.bin to decompress ucl-
decompressed uboot from 0x400000
e>update run 0xd9000030 //run the ddr_init.bin again to decompress the u-
boot-comp.bin and otzone-ucl.bin
f>update run 0x06200000 //run the otzone but not uboot.
```

#### 4.1.4 To boot secure-boot version uboot which compiled using macro, use the following commands

```
a>update cwr u-boot-usb.bin.aml.encrypt.usb.start 0xd9000000 //download signed ddr_init.bin use usb
control write command
b>update run 0xd9000000 //run the signed ddr_init.bin to init DDR/pll
c> update write u-boot-usb.bin.aml.encrypt 0x0fff8000 //u-boot-usb.bin= usb_firmware.bin +
u-boot-comp.bin (+ otzone-ucl.bin)
d>update run 0x0fff8000 //run the usb_firmware, usb_firmware
will decrypted by romcode, and tpl will decrypted by usb_firmware
```

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## 4.2 For GXBB and later chips

### 4.2.1 ddr init from usb

```
a> update cwr u-boot.bin.usb.bl2 0xd9000000 //download usb bl2
b> update write z:/..yourpath../gxb/usbb12runpara_ddrinit.bin 0xd900c000 //download bl2 para for ddr init
c> update run 0xd9000000 //run bl2 to ddr init
```

### 4.2.2 run uboot from usb

```
a> update write u-boot.bin.usb.bl2 0xd9000000 //download usb bl2
b> update write u-boot.bin.usb.tpl 0x200c000 //download usb tpl to ddr
c> update write z:/..yourpath../gxb/usbb12runpara_runfipimg.bin 0xd900c000 //download bl2 para for booting tpl
from 0x200c000
d> update run 0xd9000000 //run bl2 to booting tpl
```

(Note: To get para bin file from Attached file list of this wiki)

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## 5. Program aml\_upgrade\_package.img using update tool

Following steps are based on Amlogic 64-bits soc.

Step 1. Using attached AmlImagePack.exe ( or aml\_image\_v2\_packer if Linux pc) to Unpack aml\_upgrade\_package.img to a directory.

```
C:\Windows\System32> D:\Apps\update\AmlImagePack.exe -d D:\temp\code\autobuild\p212\aml_upgrade_package.img D:\temp\code\autobuild\p212\unpack
[Msg]Image package version 0x2
[Msg]Unpack item [USB] DDR to D:\temp\code\autobuild\p212\unpack\DDR.USB size:49152 bytes
[Msg]Unpack item [USB] UBOOT to D:\temp\code\autobuild\p212\unpack\UBOOT.USB size:835584 bytes
[Msg]Unpack item [UBOOT] aml_sdc_burn to D:\temp\code\autobuild\p212\unpack\aml_sdc_burn.UBOOT size:885248 bytes
[Msg]Unpack item [ini] aml_sdc_burn to D:\temp\code\autobuild\p212\unpack\aml_sdc_burn.ini size:502 bytes
[Msg]Unpack item [PARTITION] boot to D:\temp\code\autobuild\p212\unpack\boot.PARTITION size:10131456 bytes
[Msg]Unpack item [PARTITION] bootloader to D:\temp\code\autobuild\p212\unpack\bootloader.PARTITION size:884736 bytes
[Msg]Unpack item [PARTITION] logo to D:\temp\code\autobuild\p212\unpack\logo.PARTITION size:1160640 bytes
[Msg]Unpack item [rnl] manifest to D:\temp\code\autobuild\p212\unpack\manifest.rnl size:83948 bytes
[Msg]Unpack item [dth] season1 to D:\temp\code\autobuild\p212\unpack\season1.dth size:33927 bytes
[Msg]Unpack item [conf] platform to D:\temp\code\autobuild\p212\unpack\platform.conf size:202 bytes
[Msg]Unpack item [PARTITION] recovery to D:\temp\code\autobuild\p212\unpack\recovery.PARTITION size:12859392 bytes
[Msg]Unpack item [PARTITION] system to D:\temp\code\autobuild\p212\unpack\system.PARTITION size:406639708 bytes
[Msg]write config file 'D:\temp\code\autobuild\p212\unpack\image.cfg' OK!
Image unpack OK!
```

Step 2. Booting uboot from usb if flash has no bootloader. (Refer this document at Chapter 4)

Tips for this step : DDR.USB / UBOOT.USB in aml\_upgrade\_package.img is from the uboot spl and tpl

Step 3. Initializing flash

a> Make sure now you are in uboot WorldCup USB device mode

b> Refer Chapter 3.1.1 of this doc to initialize flash.

Step 4. Programming flash for each partition using 'update partition' command.

More detail can refer Chapter 3.1.2, note update command can only update one partition at a time.

Step 5. Reboot device

*update bulkcmd "reset"*