

Device Firmware Upgrade (DFU) - present situation and future development

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Outline

- 1 Introduction
- 2 Current implementation
- 3 Future plans
- 4 Discussion

A few words about ... me

- Embedded systems programmer
- Using u-boot since 2008
- "Blame me" for: PMIC, DFU, TRATS, OneNAND

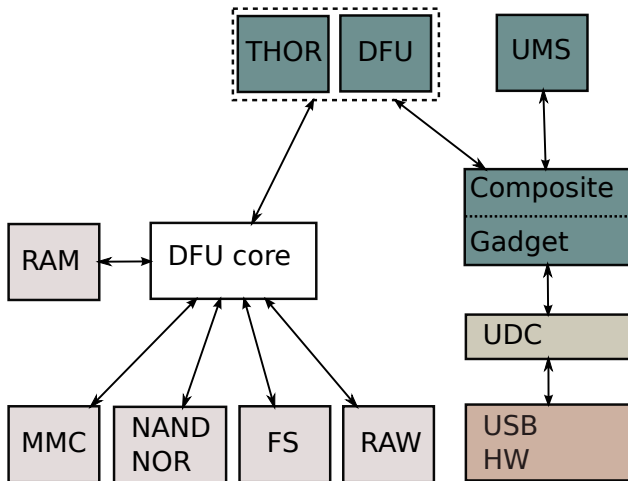
Why?

Reliable firmware download/upload for devices with constrained resources

DFU usage

- DfuSe (Device firmware upgrade STMicroelectronics Extension)
- OpenMoko u-boot
- Mainline u-boot
 - Samsung: trats, trats2
 - Ti, Siemens: am335x
 - Google: Chromebook

High level overview



Pros

- Little resources needed
- Standardised - official USB device class specification
- Vendor and device independent way of updating the firmware
- Altsettings - abstraction for flashing entities

Cons

- Slow for large files transfer (i.e. rootfs)
- 16 bit block sequence number (wBlockNum)

dfu code improvement

- Unification (redesign) of NAND and MMC generic code (dfu_{read|write})

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- Remote command execution
- Optimize USB Device Controller (UDC) driver

"dfu_alt_info" cleanup

Extract information about partitions from GPT/MBR/MTD:

- name
- start address and size
- file system type

"dfu_alt_info" cleanup (cont'd)

	<dev_name>:	<alt_name>,	<type>	extra params
1	mmc0:	rootfs,	part;	-
2	mmc0:	ulmage,	file,	part, dir;
3	nand0:	u-boot.bin,	raw,	start, size;
4	mmc0:	u-boot.bin,	raw,	start_lba, size_lba;
5	ram0:	ulmage,	ram,	start, size;
6	ubi0:	kernel0,	raw;	-
7	cmd:	cmd,	cmd;	-

dfu-util improvement

- Input from stdin ("-")
 - e.g. `echo "reset" | dfu-util -aN -`

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- Input from stdin ("-")
 - e.g. `echo "reset" | dfu-util -aN -`
- `dfu-util -l`
 - Format of displayed alt setting name will be the same as new `"dfu_alt_info"`
 - e.g. `name="ulmage" → name="mmc0:ulmage,file,boot,/"`

Q & A