



Marvell PXA Platforms

SWDownloader BLF File

Specifications

v1.0

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Marvell PXA Platforms - SWDownloader BLF File Specifications

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Caution: Indicates potential damage to hardware or software, or loss of data.



Warning: Indicates a risk of personal injury.

Document Status

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Table of Contents

1	About This Document.....	4
1.1	Purpose.....	4
1.2	Product/Sub-Product overview.....	4
1.3	Abbreviations and Acronyms.....	4
2	Blf Contents.....	5
2.1	Overview.....	5
2.2	Details Format.....	6
2.2.1	BLF_Version Section.....	6
2.2.2	UE_Boot_Option.....	6
2.2.3	Flash_Properties Section.....	6
2.2.4	Flash_Options Section.....	6
2.2.5	TIM_Configuration Section.....	7
2.2.6	EraseOnly_Option Section.....	7
2.2.7	Reserved_Data Section.....	8
2.2.8	Extended_Reserved_Data Section.....	8
2.2.9	Digital_Signature_Data Section.....	9
2.2.10	DTIM_Keys_Data Section.....	10
2.2.11	Image_List Section.....	11
2.2.12	EMMC_Images_list_Property section.....	12
2.2.13	Nand_Images_list_Property section.....	13
3	Appendix.....	15
3.1	Report issues.....	15



1 About This Document

1.1 Purpose

The purpose of this document is to describe the format and design details for SWDownloader blf file. It will help user to understand the blf setting , but It is better to modify Blf configurations by SWDownloader, since it will help user to check unexpected error when set value to see if is valid or not

1.2 Product/Sub-Product overview

This document refers to the all processors supported by SWDownloader

1.3 Abbreviations and Acronyms

Table 1.1: Abbreviations and Acronyms

Acronym	Description
SWD	Software Downloader
UE	User Equipment

2 Blf Contents

2.1 Overview

Marvell PXA SWDownloader reference design blf file include several setting sections

1. [BLF_Version]
 - Distinguish different blf version, different blf version have different handle way when processing image files and generating tim/dtim file.
2. [UE_Options]
 - Set Operations for UE after download.
3. [Flash_Properties]
 - Info about flash to be burning and download, user can modify those values on different flash.
4. [Flash_Options]
 - Operations to be done on flash for OBM.
5. [TIM_Configuration]
 - Info and setting for TIM those setting are added into Tim/dtim files.
6. [EraseOnly_Option]
 - Erase only area without burning in burning flash
7. [Reserved_Data]
 - Reserved data package for Bootrom and OBM use in running or downloading.
8. [Extended_Reserved_Data]
 - Extended Reserved data package for Bootrom and OBM use in running or downloading
9. [Digital_Signature_Data]
 - OEM platform key pair info in trust boot mode in Tim for security boot and verification.
 - Only set in trust blf.
10. [Keys_Data]
 - Additional OEM keys to do AUTH.
 - only set in trust blf.
11. [DTIM_Keys_Data]
 - OEM platform key pair info in trust boot mode in DTim for security boot and verification
 - Only set in trust blf.
12. [Image_List]
 - Images to be downloaded and burnt into flash

2.2 Details Format

2.2.1 BLF_Version Section

Field Setting Name	Value	Descriptions
Blf_Version_Number	V2.1.0	User can't modify it

2.2.2 UE_Boot_Option

Field Setting Name	Value	Descriptions
UE_Boot_Option	0	User can set it as : 0- OBM not reset UE after burning flash 1- OBM reset UE after burning flash

2.2.3 Flash_Properties Section

Field Setting Name	Value	Descriptions
Max_Upload_Split_Size	0x20000000	this value depends on available DDR size in download
Max_FBF_Split_Size	0x20000000	this value depends on available DDR size in download, need to configure it smaller than UE available DDR size or equal to available DDR size
Flash_Family	eMMC	Flash family name, character string only can be set as: eMMC NAND SPI-NOR
Spare_Area_Size	0	Spare area size for flash, only set when Flash_Family = NAND , size value depends on flash datasheet
Data_Area_Size	0	Data area size for flash
FBF_Sector_Size	4096	It is a fixed value set by SWDownloader, can't modify
Number_of_EMMCTypes	1,2,3...etc	It is a optional configuration if user want to configure multiple EMMC size type images configuration support

2.2.4 Flash_Options Section

Field Setting Name	Value	Descriptions
ProductionMode	0	Not used , reserved in future
Skip_Blocks_Number	null character string	Set skip block number , only used when Flash_Family = NAND
Reset_BBT	eMMC	0-OBM not reset BBT in burning flash 1-OBM will reset BBT in burning flash
Erase_All_Flash	0	0-OBM not erase all flash in burning flash 1-OBM will erase all flash in burning flash

2.2.5 TIM_Configuration Section

Field Setting Name	Value	Descriptions
Number_of_Images	15	Numbers of images in [Image_List] section in blf
Number_of_Keys	0	Numbers of key in [Keys_Data] section , if there is no [Keys_Data] section, it would be 0, only set in trust blf file
WTM_Save_State_Flash_Signature	0x4D4D4308	User can't modify it, just follow marvell each platform reference design blf
WTM_Save_State_Flash_Entry_Address	0x00000000	User can't modify it, just follow marvell each platform reference design blf
WTM_Save_State_BackUp_Entry_Address	0x00000000	User can't modify it, just follow marvell each platform reference design blf
Boot_Flash_Signature	0x4D4D4308	User can't modify it, follow marvell each platform reference design blf
Processor_Type	PXA1088	User can't modify it, just follow marvell each platform reference design blf
OEM_UniqueID	0x4f524312	User can't modify it, just follow marvell each platform reference design blf
Issue_Date	0x20130115	User can't modify it, just follow marvell each platform reference design blf
Version	0x00030400	User don't modify it, just follow marvell each platform reference design blf
Trusted	1	0-Non trust blf 1-Trust blf

2.2.6 EraseOnly_Option Section

Field Setting Name	Value	Descriptions
ProductionMode	0	Not used , reserved in future
Total_Eraseonly_Areas	1	Number of areas to do erase only in burning flash
1_Eraseonly_Area_Size	0x000100000	Size to do erase only on flash
1_Eraseonly_Area_FlashStartAddress	0x1000	Offset for flash where to do erase only operation
1_Eraseonly_Area_Partition	1	eMMC partition location of this area 0- BOOT partition 1-User partition 2-User partition

2.2.7 Reserved_Data Section

Notes

Reserved Data section set serveal reserved package include ID and values ,etc, different Package have different structure , please Use SWDownloader UI and see comments in setting reserved package .

Hot Fix Area:
HTFX
Load_Address = 0xD1008000
HTFX_PATH = falcon_htfx_patch.bin
Patch_Size = 0x2E98
End_HTFX

Patch_Size could be automatically calculate by SWD.

2.2.8 Extended_Reserved_Data Section

Descriptions

Extended Reserved Data section set serveal reserved package include ID and values ,etc, different Package have different structure , please Use SWDownloader UI and see comments in setting Extended reserved package , those all settings will be write into tim file

1. Common settings are relate about DDR setting

Take **WRITE = <0xC0100010,0x000D0001>** ;**DDR_MEM_ADDR_MAP0** for example:

WRITE -----> operation for Bootrom or OBM

0xC0100010 -----> DDR Register

0x000D0001 -----> value for DDR Register 0xC0100010

;DDR_MEM_ADDR_MAP0 -----> comments for for DDR Register 0xC0100010

2. IMAP configuration for DTIM file

Image_Maps

NUM_MAPS = 3 -----> [Comments: Numbers of Dtim files]

1_Image_Map_Info

1_Image_ID = 0x54494D31 -----> [Comments: 1st Dtim image id]

1_Image_Type = PRIMARYIMAGE -----> [Comments: 1st Dtim image type, user must set its value by SWDdownloader in IMAP of extended reserved data package]

1_Flash_Address_Lo = 0x0000EFE000 -----> [Comments: 1st Dtim image flash address]

1_Flash_Address_Hi = 0x00000000 -----> [Comments: Not used , reserved for future usage]

1_Partition = 0x0 -----> [Comments: Not used , reserved for future usage]

1_End_Image_Map_Info

2_Image_Map_Info

2_Image_ID = 0x54494D32

2_Image_Type = RECOVERYIMAGE

2_Flash_Address_Lo = 0x00003FE000

2_Flash_Address_Hi = 0x00000000

2_Partition = 0x0

2_End_Image_Map_Info

3_Image_Map_Info


```

3_Image_ID = 0x54494D33
3_Image_Type = CPIMAGE
3_Flash_Address_Lo = 0x0021EFE000
3_Flash_Address_Hi = 0x00000000
3_Partition = 0x00000000
3_End_Image_Map_Info
4_Image_Map_Info
4_Image_ID = 0x54494D34
4_Image_Type = PPSETTINGIMAG
4_Flash_Address_Lo = 0x0000380000
4_Flash_Address_Hi = 0x00000000
4_Partition = 0x00000000
4_Enable = 1
4_End_Image_Map_Info
End_Image_Maps
3. Vendor_DDR_Initialization
4. This filed is a real configuration for different vendor DDR type , user can set multiple
cases to support multiple vendor DDR in blf to unify blf file if only DDR vendor is
different .Actullay its contents are same as Common settings are relate about DDR
setting like DDR_Initialization package except vendor ID

```

2.2.9 Digital_Signature_Data Section

Field Setting Name	Value	Descriptions
Hash_Algorithm_ID	SHA-160	Hash ID setting, just follow Marvell's each platform reference design blf.
DSA_Algorithm	PKCS1_v1_5_lppcp	DSA Algorithm, just follow Marvell's each platform reference design blf.
Key_Size_in_bits	1024	Key size, just follow Marvell's each platform reference design blf.
RSA_Public_Exponent	#1 = 0x00000003	RSA public exponent, it is a key pair with RSA System Modulus and RSA Private Key, it will be save into Tim file.
RSA_System_Modulus	#1 = 0xe34f43bd #2 = 0x75049e3f #3 = 0xa3527b1a #4 = 0x9846d1ac #5 = 0xd15dc003 #6 = 0x0b3df2f4 #7 = 0xb9ad7a35 #8 = 0x5df0ec2d #9 = 0xe48af431 #10 = 0xae9f9e5 #11 = 0x4925fd4f #12 = 0x5aafef7c #13 = 0x4e676f39 #14 = 0x3a3a69be #15 = 0x9ec21e4d #16 = 0xd5c1e639 #17 = 0x984ab34b #18 = 0xe9802cb8 #19 = 0x0fa840f5 #20 = 0x28a83fe7 #21 = 0x64d6569a #22 = 0x80172de0 #23 = 0x450d7fa9 #24 = 0x52e6a947 #25 = 0xee8b271 #26 = 0x7954d939 #27 = 0x003bc642 #28 = 0xd0ad7e5 #29 = 0x664ca269 #30 = 0xf9786672 #31 = 0xdf54fe8 #32 = 0xacd1cc46	RSA System Modulus, , it is a key pair with RSA public exponent and RSA Private Key, it will be saved into Tim file.
RSA_Private_Key	#1 = 0x241d3c4b #2 = 0xc127fd13 #3 = 0xdf07bed5 #4 = 0x677bfe89	RSA Private Key, it will not be written into Tim file, it

	#5 = 0x5c462ed5 #6 = 0xa3b76928 #7 = 0x3f80c933 #8 = 0x16b541b3 #9 = 0xbcb93bca #10 = 0xc9d0f042 #11 = 0x8e528a1a #12 = 0x6bc15b35 #13 = 0x6c8a4a0e #14 = 0x8c9efbb2 #15 = 0xac8d36a9 #16 = 0x5d7b4daa #17 = 0x1961c88c #18 = 0xfc400774 #19 = 0xd7f16028 #20 = 0xb1715ffb #21 = 0x6623b919 #22 = 0xea8e87a5 #23 = 0xe0d79546 #24 = 0xe326718b #25 = 0xa7d17312 #26 = 0xbce37989 #27 = 0xd55f4bb5 #28 = 0x822c7950 #29 = 0x66621b11 #30 = 0x7ee96668 #31 = 0xcffb8d51 #32 = 0x1ccda20b	should be handed by OEM only and not exposed to others for keep security boot
--	---	---

2.2.10 DTIM_Keys_Data Section

Field Setting Name	Value	Descriptions
Hash_Algorithm_ID	SHA-160	Hash ID setting, just follow Marvell's each platform reference design blf.
DSA_Algorithm	PKCS1_v1_5_lppcp	DSA Algorithm, just follow Marvell's each platform reference design blf.
Key_Size_in_bits	1024	Key size , just follow Marvell's each platform reference design blf.
RSA_Public_Exponent	#1 = 0x00000003	RSA public exponent, it is a key pair with RSA System Modulus and RSA Private Key, it will be save into DTim file.
RSA_System_Modulus	#1 = 0xe34f43bd #2 = 0x75049e3f #3 = 0xa3527b1a #4 = 0x9846d1ac #5 = 0xd15dc003 #6 = 0x0b3df2f4 #7 = 0xb9ad7a35 #8 = 0x5df0ec2d #9 = 0xe48af431 #10 = 0xae9f9e5 #11 = 0x4925fd4f #12 = 0x5aafef7c #13 = 0x4e676f39 #14 = 0x3a3a69be #15 = 0x9ec21e4d #16 = 0xd5c1e639 #17 = 0x984ab34b #18 = 0xe9802cb8 #19 = 0x0fa840f5 #20 = 0x28a83fe7 #21 = 0x64d6569a #22 = 0x80172de0 #23 = 0x450d7fa9 #24 = 0x52e6a947 #25 = 0xee8b271 #26 = 0x7954d939 #27 = 0x003bc642 #28 = 0x0d0ad7e5 #29 = 0x664ca269 #30 = 0xf9786672 #31 = 0xdf54fe8 #32 = 0xacd1cc46	RSA System Modulus, it is a key pair with RSA public exponent and RSA Private Key, it will be saved into DTim file.
RSA_Private_Key	#1 = 0x241d3c4b #2 = 0xc127fd13 #3 = 0xdf07bed5 #4 = 0x677bfe89 #5 = 0x5c462ed5 #6 = 0xa3b76928 #7 = 0x3f80c933 #8 = 0x16b541b3 #9 = 0xbcb93bca #10 = 0xc9d0f042	RSA Private Key, it will not be written into DTim file, it should be handed by OEM only and not exposed to others for keep security

	#11 = 0x8e528a1a #12 = 0x6bc15b35 #13 = 0x6c8a4a0e #14 = 0x8c9efbb2 #15 = 0xac8d36a9 #16 = 0x5d7b4daa #17 = 0x1961c88c #18 = 0xfc400774 #19 = 0xd7f16028 #20 = 0xb1715ffb #21 = 0x6623b919 #22 = 0xeaae87a5 #23 = 0xe0d79546 #24 = 0xe326718b #25 = 0xa7d17312 #26 = 0xbbe37989 #27 = 0xd55f4bb5 #28 = 0x822c7950 #29 = 0x66621b11 #30 = 0x7ee96668 #31 = 0xcffb8d51 #32 = 0x1ccda20b	boot
--	---	------

2.2.11 Image_List Section

Field Setting Name	Value	Descriptions
x_Image_Enable	1	Switch option for user to decide if download this image or not. 1– downloaded this image 0 – not download this image
x_Image_Tim_Included	1	Tim included property, currently there are 5 options for user to set Not included into any tim file Included into tim file Included into Dtim primary Included into Dtim recovery Included into Dtim CP
x_Image_Image_ID	0x54494D48	Hex Ascii of Image ID Name to identify different images in tim
x_Image_Next_Image_ID	0x4F424D49	x+1_Image_Image_ID value
x_Image_Path	tim_helan.bin	Image file name, it is a relative path compared current blf file
x_Image_Flash_Entry_Address	0x0000000000	Flash address location, this image will be burned start from this position on flash
x_Image_Load_Address	0xD1000000	Load address in DDR if it need OBM to load , if set 0xffffffff, it means OBM don't need to load it
x_Image_Type	RAW	Image format, OBM just take it as raw data and burn to flash without any conversion, other images types option: RAW : raw data, no special for OBM RND : Marvell format reliable data file SPARSE : one type of file system , YAFFS : one type of file system JFFS2 : one type of file system UBIFS : one type of file system LZMA : one compressed format file YAFFS_LZMA : YAFFS type image, SWD need to compress YAFFS image to lzma format file, then put this lzma file into download file

		UBIFS_LZMA : UBIFS type image, but SWD need to compress UBIFS image to lzma format file, then put this lzma file into download file JFFS2_LZMA : JFFS2 type image, but SWD need to compress JFFS2 image to lzma format file, then put this lzma file into download file RAW_LZMA : RAW image, but SWD need to compress raw image to lzma format file, then put this lzma file into download file
x_Image_ID_Name	TIMH	Image ID name, must be four words
x_Image_Erase_Size	NULL EMPTY STRING	User set this value if want to set same value for a image , and if erase size is set and OBM will erase same size in flash
x_Image_Partition_Number	1	Image partition location on emmc flash
x_Image_Image_Size_To_Hash_in_bytes	0xFFFFFFFF	Hash size , if user set it 0xffffffff, tool will calculate actual image size for user, otherwise , you can set it by yourself if you want to hash part of the image

2.2.12 EMMC_Images_list_Property section

This section only exist when user configure Number_of_EMMCTypes are larger than 1

Field Setting Name	Value	Descriptions
x_EMMC_Size	0x20000000 or others	EMMC Size , Unit is bytes
x_ImageID_num	1,2,3...	Describe how many ID are different since EMMC size is different
x_EmmcType_y_Image_ID_Name	PGPT	Image ID Name to identify different images , y is from 0 to x_ImageID_num
x_EmmcType_y_Image_Path	..\primary_gpt	Image file name, it is a relative path compared current blf file
x_EmmcType_y_Image_Flash_Entry_Address	0x0000000000	Flash address location, this image will be burned start from this position on flash
x_EmmcType_y_Image_Load_Address	0xFFFFFFFF	Load address in DDR if it need OBM to load , if set 0xffffffff, it means OBM don't need to load it
x_EmmcType_y_Image_Erase_Size	NULL EMPTY STRING	User set this value if want to set same value for a image , and if erase size is set and OBM will erase same size in flash
x_EmmcType_y_Image_Image_Size_To_Hash_in_bytes	0xFFFFFFFF	Hash size , if user set it 0xffffffff, tool will calculate actual image size for user, otherwise , you can set it

		by yourself if you want to hash part of the image
--	--	---

2.2.13 Nand_Images_list_Property section

This section only exist when user configure multiple nand ID type in one blf.

Field Setting Name	Value	Descriptions
x_NandSign_Value	0x4E414E04 or others	Nand flash boot signature,x is from 1 to Nand_Signature_Number
x_NandSign_NandIdNumber	1,2,3...	Describe NandID number with the same signature value
x_NandSign_y_NandId	0xaaad or others	Flash Nand Id with the signature "x_NandSign_Value", y is from 1 to x_NandSign_NandIdNumber
x_NandSign_y_NandSize	0x04000000	Nand Size , Unit is bytes
x_NandSign_y_NandId_ImageNumber	1,2,3...	Describe how many ID are different since Nand ID is different
x_NandSign_y_NandId_z_Image_ID_Name	RBLI	Image ID Name to identify different images , z is from 1 to x_NandSign_y_NandId_ImageNumber
x_NandSign_y_NandId_z_Image_Path	..\pxa1826_ReliableData.bin	Image file name, it is a relative path compared current blf file
x_NandSign_y_NandId_z_Image_Flash_Entry_Address	0x0000000000	Flash address location, this image will be burned start from this position on flash
x_NandSign_y_NandId_z_Image_Load_Address	0xFFFFFFFF	Load address in DDR if it need OBM to load , if set 0xffffffff, it means OBM don't need to load it
x_NandSign_y_NandId_z_Image_Erase_Size	NULL EMPTY STRING	User set this value if want to set same value for a image , and if erase size is set and OBM will erase same size in flash
x_NandSign_y_NandId_z_Image_Image_Size_To_Hash_in_bytes	0xFFFFFFFF	Hash size , if user set it 0xffffffff, tool will calculate actual image size for user, otherwise , you can set it by yourself if you want to hash part of the image

The SWD support nand ID array is :

```
const stDdrVendorIdNameMap vendorDdrPidNameMap[MAX_DDR_VENDOR_NUM]={
    {0x01,_T("SAMSUNG")},
    {0x02,_T("QIMONDA")},
    {0x03,_T("ELPIDA")},
    {0x04,_T("ETRON")},
    {0x05,_T("NANYA")},
    {0x06,_T("HYNIX")},
    {0x07,_T("MOSEL")},
    {0x08,_T("WINBOND")},
    {0x09,_T("ESMT")},
```



```
{0x0A,_T("RESERVED")},
{0x0B,_T("SPANSION")},
{0x0C,_T("SST")},
{0x0D,_T("ZMOS")},
{0x0E,_T("INTEL")},
{0x0F,_T("NUMONYX")},
{0x10,_T("MICRON")},
{0x11,_T("TOSHIBA")},
{0x12,_T("FIDELIX")},
{0x13,_T("ReservedVendor1")},
{0x14,_T("ReservedVendor2")},
{0x15,_T("ReservedVendor3")},
{0x16,_T("ReservedVendor4")},
{0x17,_T("ReservedVendor5")},
{0x18,_T("ReservedVendor6")},
{0x19,_T("ReservedVendor7")},
{0x1A,_T("ReservedVendor8")},
{0x1B,_T("ReservedVendor9")},
{0x1C,_T("JSC")},
{0x1D,_T("ReservedVendor11")},
{0x1E,_T("ReservedVendor12")},
{0xF8,_T("Fidelix")},
{0xFD,_T("ESMT2")},
{0xFE,_T("Numonyx")},
{0xFF,_T("Micron")},
};
```

3 Appendix

3.1 Report issues

Please send email to Marvell with “SWDownloader Issue Report: ...” title.

Or visit webs: <http://support.marvell.com>.

Or submit an issue at CQ web: <http://sh2-cq01.marvell.com/cqweb/login>.



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