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ファームウェアの更新

bootloader からの更新

TFTP でファームウェアをダウンロードして更新を行います。

```
(MAE) # dhcp
BOOTP broadcast 1
*** Unhandled DHCP Option in OFFER/ACK: 42
*** Unhandled DHCP Option in OFFER/ACK: 28
*** Unhandled DHCP Option in OFFER/ACK: 42
*** Unhandled DHCP Option in OFFER/ACK: 28
DHCP client bound to address 192.168.253.211
Using eth1 device
TFTP from server 192.168.253.1; our IP address is 192.168.253.211
Filename 'mae4xx_xenial_v3_0_0.img'.
Load address: 0x48000000
Loading: T T
#####
#####
#####
#####
#####
#####
... 中略 ...
#####
#####
#####
done
Bytes transferred = 77479262 (49e3d5e hex)
(MAE) #
```

ダウンロードが完了しました。
ファームウェアファイルは ZIP 形式となっていますので、内容を確認してみます。

dhcp コマンドにより TFTP でダウンロードすると、環境変数の

- fileaddr
- filesize

にそれぞれダウンロードしたアドレスとサイズがセットされますので、それを使用します。

```
(MAE) # zipextract $fileaddr $filesize
Archive:
Length  Method  Size  Cmpr  Date   Time   CRC-32  Name
-----  -
3711744  Stored  3711744  0%  2017-11-21  10:43  9a12519d  kernel.img
604160   Stored  604160   0%  2017-11-21  10:43  5881d27a  kmod.img
```

2834928	Stored	2834928	0%	2017-11-21	10:44	e40eb7e9	initramfs.img
70295552	Defl:N	70297396	0%	2018-03-14	11:05	a425e4e8	rootfs.img
27643	Defl:N	6904	76%	2017-11-21	10:43	7e82142b	dtb.img
100277	Defl:N	23230	77%	2017-11-21	10:43	0bad5400	.config
-----		-----	---				-----
77574304		77478362	1%				6 files

(MAE) #

内容が確認できました。

これを用いてファームウェアを更新してみます。
ファームウェア更新には、**firmup** コマンドを使用します。引数は下記のとおりとなっています。

```
(MAE) # firmup
firmup - firmup

Usage:
firmup fimraddr, firmlen, [area (0/1)]
```

ここでも先程と同様に、環境変数にセットされた値を使用します。

```
(MAE) # firmup $fileaddr $filesize
firmup: zip addr: 48000000, zip len: 77479262 ==> extract buffer addr:
4c9e3d61
* search kernel.img...
file 'kernel.img' compression type is COMP_NONE, stored at addr: 48000044,
size: 3711744 (0x0038a300)
* updating kernel...

device nand0 <nand0>, # parts = 1
#: name          size          offset          mask_flags
0: nand0.ubi     0x20000000    0x00000000     0

active partition: nand0,0 - (nand0.ubi) 0x20000000 @ 0x00000000

defaults:
mtdids : nand0=nand0
mtdparts: mtdparts=nand0:512M(nand0.ubi)
Creating 1 MTD partitions on "nand0":
0x000000000000-0x000020000000 : "mtd=0"
UBI: attaching mtd2 to ubi0
UBI: physical eraseblock size: 262144 bytes (256 KiB)
UBI: logical eraseblock size: 253952 bytes
UBI: smallest flash I/O unit: 4096
UBI: VID header offset: 4096 (aligned 4096)
UBI: data offset: 8192
UBI: attached mtd2 to ubi0
UBI: MTD device name: "mtd=0"
UBI: MTD device size: 512 MiB
```

```
UBI: number of good PEBs:      2048
UBI: number of bad PEBs:      0
UBI: max. allowed volumes:    128
UBI: wear-leveling threshold: 4096
UBI: number of internal volumes: 1
UBI: number of user volumes:   12
UBI: available PEBs:          0
UBI: total number of reserved PEBs: 2048
UBI: number of PEBs reserved for bad PEB handling: 40
UBI: max/mean erase counter: 33/1
3711744 bytes written to volume kernel.0
* search dtb.img...
file 'dtb.img' total length extracted: 27643 (0x00006bfb)
* updating dtb...
27643 bytes written to volume dtb.0
* search initramfs.img...
file 'initramfs.img' compression type is COMP_NONE, stored at addr:
4841dbcd, size: 2834928 (0x002b41f0)
* updating initramfs...
2834928 bytes written to volume initramfs.0
* search kmod.img...
file 'kmod.img' compression type is COMP_NONE, stored at addr: 4838a386,
size: 604160 (0x00093800)
* updating kmod...
604160 bytes written to volume kmod.0
* search rootfs.img...
file 'rootfs.img' total length extracted: 70295552 (0x0430a000)
* updating rootfs...
70295552 bytes written to volume rootfs.0
* search opt.img...
zip_extract: file 'opt.img' not found in zip archive.
-> not found.
* search u-boot.bin.img...
zip_extract: file 'u-boot.bin.img' not found in zip archive.
-> not found.
SF: Detected S25FL256S with page size 64 KiB, total 32 MiB
* set latest firmware area: 0
(MAE) #
```

MA-E3xx シリーズよりも NAND Flash のアクセスが低速なので少し長く時間がかかります。

『**最終のファームウェア領域**』に “0” がセットされたと出力されていますので、状況を確認してみます。

```
(MAE) # firminfo -g 1
=== firmup history ===
- entry 0:
  timestamp: 1521078410 (2018/03/15 10:46:50)
  area: 0x10
```

“area” が 0x10 になっていることが確認できました。

reset コマンドで再起動すると最新ファームウェアで起動します。

```
/dev/ttyUSB5 - PuTTY
[ OK ] Started LSB: set CPUFreq kernel parameters.
[ OK ] Started dnsmasq - A lightweight DHCP and caching DNS server.
[ OK ] Reached target Host and Network Name Lookups.
[ OK ] Started Raise network interfaces.
[ OK ] Started firewalld - dynamic firewall daemon.
[ OK ] Reached target Network.
Starting A high performance web server and a reverse proxy server...
Starting OpenVPN service...
Starting OpenBSD Secure Shell server...
[ OK ] Reached target Network is Online.
Starting LSB: Update dynamic domain name service entries...
Starting /etc/rc.local Compatibility...
[ OK ] Started OpenVPN service.
[ OK ] Started LSB: Update dynamic domain name service entries.
[ OK ] Started /etc/rc.local Compatibility.
[ OK ] Started Serial Getty on ttyMSM2.
[ OK ] Started Serial Getty on ttyMSM1.
[ OK ] Started Getty on tty1.
[ OK ] Started Serial Getty on ttyMSM0.
[ OK ] Reached target Login Prompts.
[ OK ] Started A high performance web server and a reverse proxy server.
[ OK ] Started OpenBSD Secure Shell server.
[ OK ] Reached target Multi-User System.
[ OK ] Reached target Graphical Interface.
Starting Update UTMP about System Runlevel Changes...
[ OK ] Started Update UTMP about System Runlevel Changes.

Ubuntu 16.04.4 LTS kumquat ttyMSM0

kumquat login: user1
Password:
Last login: Fri Mar  2 18:24:14 JST 2018 from 192.168.253.1 on pts/0
Welcome to Ubuntu 16.04.4 LTS (GNU/Linux 4.4.30 armv7l)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage
user1@kumquat:~$ cat /etc/version
MA-E4xx firmware version 3.0.0 (Wed Mar 14 11:04:53 JST 2018)
user1@kumquat:~$
```

起動できました。

Linux からの更新

From: <https://wiki.centurysys.net/> - MA-X/MA-S/MA-E/IP-K Developers' Wiki

Permanent link: https://wiki.centurysys.net/doku.php?id=mae4xx_ope:update_firmware:start

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