

Mango-IMX6Q Yocto Project

Source 다운로드 및 소스 추출 방법

<http://www.mangoboard.com/>

<http://cafe.naver.com/embeddedcrazyboys>

Crazy Embedded Laboratory



Document History

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1. 소스 다운로드 및 컴파일 방법

1) Git 설정을 해줍니다.

```
$ mkdir fsl-release-bsp  
$ cd fsl-release-bsp  
$ git config --global user.name "이름"  
$ git config --global user.email "이메일"
```

```
$ repo init -u git://git.freescale.com/imx/fsl-arm-yocto-bsp.git -b imx-3.10.17-1.0.0_ga  
Get https://gerrit.googlesource.com/git-repo  
remote: Counting objects: 117, done  
remote: Finding sources: 100% (117/117)  
remote: Total 2920 (delta 1538), reused 2920 (delta 1538)  
Receiving objects: 100% (2920/2920), 2.47 MiB | 3.48 MiB/s, done.  
Resolving deltas: 100% (1538/1538), done.  
From https://gerrit.googlesource.com/git-repo  
* [new branch]      maint      -> origin/maint  
* [new branch]      master     -> origin/master  
* [new branch]      stable     -> origin/stable  
* [new tag]         v1.0       -> v1.0  
* [new tag]         v1.0.1     -> v1.0.1  
* [new tag]         v1.0.2     -> v1.0.2  
* [new tag]         v1.0.3     -> v1.0.3  
* [new tag]         v1.0.4     -> v1.0.4  
* [new tag]         v1.0.5     -> v1.0.5  
* [new tag]         v1.0.6     -> v1.0.6  
* [new tag]         v1.0.7     -> v1.0.7  
* [new tag]         v1.0.8     -> v1.0.8  
* [new tag]         v1.0.9     -> v1.0.9  
* [new tag]         v1.1       -> v1.1  
... 생략 ....  
* [new tag]         v1.8.2     -> v1.8.2  
* [new tag]         v1.9.0     -> v1.9.0  
* [new tag]         v1.9.1     -> v1.9.1  
* [new tag]         v1.9.2     -> v1.9.2  
* [new tag]         v1.9.3     -> v1.9.3  
* [new tag]         v1.9.4     -> v1.9.4
```

```

* [new tag]          v1.9.5    -> v1.9.5
* [new tag]          v1.9.6    -> v1.9.6
Get git://git.freescale.com/imx/fsl-arm-yocto-bsp.git
remote: Counting objects: 104, done.
remote: Compressing objects: 100% (103/103), done.
remote: Total 104 (delta 33), reused 0 (delta 0)
Receiving objects: 100% (104/104), 14.83 KiB, done.
Resolving deltas: 100% (33/33), done.
From git://git.freescale.com/imx/fsl-arm-yocto-bsp
* [new branch]      imx-3.10.17-1.0.0_ga -> origin/imx-3.10.17-1.0.0_ga
* [new branch]      imx-3.10.17-1.0.1_ga -> origin/imx-3.10.17-1.0.1_ga
* [new branch]      imx-3.10.31-1.1.0_alpha -> origin/imx-3.10.31-1.1.0_alpha
* [new branch]      imx-3.10.31-1.1.0_beta -> origin/imx-3.10.31-1.1.0_beta

Your identity is: treego <treego@crz-tech.com>
If you want to change this, please re-run 'repo init' with --config-name

Testing colored output (for 'repo diff', 'repo status'):
  black  red    green  yellow  blue   magenta  cyan   white
  bold   dim    ul     reverse

Enable color display in this user account (y/N)?

```

2) 해당 소스를 다운 받습니다. 시간이 오래 걸립니다.

```

$ repo sync
Fetching project meta-browser
Fetching project meta-openembedded
remote: Counting objects: 1324, done.
remote: Counting objects: 41552, done.
remote: Compressing objects: 100% (15835/15835), done.
remote: Total 1324 (delta 0), reused 0 (delta 0)
Receiving objects: 100% (1324/1324), 358.69 KiB | 142 KiB/s, done.
Resolving deltas: 100% (790/790), done.
From git://github.com/OSSystems/meta-browseriB | 159 KiB/s
... 생략 ....
* [new tag]          yocto-1.5    -> yocto-1.5
* [new tag]          yocto-1.5.1 -> yocto-1.5.1
* [new tag]          yocto-1.5.1.final -> yocto-1.5.1.final

```

```
* [new tag]      yocto-1.5.2 -> yocto-1.5.2
* [new tag]      yocto-1.5.3 -> yocto-1.5.3
* [new tag]      yocto-1.5.final -> yocto-1.5.final
* [new tag]      yocto-1.5_M5.rc2 -> yocto-1.5_M5.rc2
* [new tag]      yocto-1.6 -> yocto-1.6
* [new tag]      yocto-1.6.1 -> yocto-1.6.1
* [new tag]      yocto_1.5_M5.rc8 -> yocto_1.5_M5.rc8
```

Fetching projects: 100% (8/8), done.

Checking out files: 100% (4486/4486), done. files: 10% (466/4486)

Syncing work tree: 100% (8/8), done.

3) 완료 되면, 아래와 같이 소스가 다운 받아 집니다.

```
$ ls
README  downloads  fsl-setup-release.sh  imx6q-yocto  setup-environment
sources
```

4) "fsl-setup-release.sh" 스크립트 파일을 이용해서, 컴파일 설정을 해줍니다.

```
$ MACHINE=imx6qsabresd source fsl-setup-release.sh -b imx6q-yocto -e fb
```

```
Build directory is  imx6q-yocto
```

```
Using FB backend with FB DIST_FEATURES to override poky X11 DIST FEATURES
Configuring for imx6qsabresd
```

```
Some SoC depends on libraries and packages that are covered by
Freescale EULA. To have the right to use those binaries in your images
you need to read and accept the EULA that will be displayed.
```

```
LA_OPT27 v4 June 2013
```

```
FREESCALE SEMICONDUCTOR SOFTWARE LICENSE AGREEMENT
```

```
IMPORTANT. Read the following Freescale Semiconductor Software
License Agreement ("Agreement") completely. By selecting the
```

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Do you accept the EULA you just read? (y/n) **y**
EULA has been accepted.

Welcome to Freescale Community BSP

The Yocto Project has extensive documentation about OE including a

reference manual which can be found at:

<http://yoctoproject.org/documentation>

For more information about OpenEmbedded see their website:

<http://www.openembedded.org/>

You can now run 'bitbake <target>'

Common targets are:

core-image-minimal

meta-toolchain

meta-toolchain-sdk

adt-installer

meta-ide-support

Your build environment has been configured with:

MACHINE=imx6qsabresd

SDKMACHINE=i686

DISTRO=poky

EULA=1

5) "bitbake" 명령으로 컴파일을 진행하게 되는데, 아래와 같이 에러가 발생 됩니다.

```
$ bitbake fsl-image-fb
```

```
ERROR: Fetcher failure for URL: 'http://cgit.freedesktop.org/~whot/evtest/snapshot/evtest-1.25.tar.bz2;name=archive'. Checksum mismatch!
```

```
File: '/home/treego/PROJECT/temp2/wisol/freescale-imx6/work/Yocto/fsl-release-bsp/downloads/evtest-1.25.tar.bz2' has md5 checksum 0ef3fe5e20fa2dee8994827d48482902 when 770d6af03affe976bdbe3ad1a922c973 was expected
```

```
File: '/home/treego/PROJECT/temp2/wisol/freescale-imx6/work/Yocto/fsl-release-bsp/downloads/evtest-1.25.tar.bz2' has sha256 checksum
```

```
6e93ef54f0aa7d263f5486ce4a14cac53cf50036bfd20cf045fef2b27ee6664b when 3d34123c68014dae6f7c19144ef79ea2915fa7a2f89ea35ca375a9cf9e191473 was expected
```

If this change is expected (e.g. you have upgraded to a new version without updating the checksums) then you can use these lines within the recipe:
SRC_URI[archive.md5sum] = "0ef3fe5e20fa2dee8994827d48482902"
SRC_URI[archive.sha256sum] =
"6e93ef54f0aa7d263f5486ce4a14cac53cf50036bfd20cf045fef2b27ee6664b"
Otherwise you should retry the download and/or check with upstream to determine if the file has become corrupted or otherwise unexpectedly modified.

```
ERROR: Function failed: Fetcher failure for URL:  
'http://cgit.freedesktop.org/~whot/evtest/snapshot/evtest-1.25.tar.bz2;name=archive'. Unable to fetch  
URL from any source.  
ERROR: Logfile of failure stored in: /home/treego/PROJECT/temp2/wisol/freescale-  
imx6/work/Yocto/fsl-release-bsp/imx6q-yocto/tmp/work/cortexa9hf-vfp-neon-poky-linux-  
gnueabi/evtest/1.25-r0/temp/log.do_fetch.13688  
ERROR: Task 1785 (/home/treego/PROJECT/temp2/wisol/freescale-imx6/work/Yocto/fsl-release-  
bsp/sources/meta-openembedded/meta-oe/recipes-support/evtest/evtest_1.25.bb, do_fetch) failed  
with exit code '1'  
NOTE: Tasks Summary: Attempted 2363 tasks of which 642 didn't need to be rerun and 1 failed.  
Waiting for 0 running tasks to finish:
```

6) evtest 패키지가 해당 URL에서 받아오질 못해서 생기는 에러입니다. 아래 명령
으로 다른 위치에서 다운받아서 처리합니다.

```
$ wget http://dev.gateworks.com/sources/evtest-1.25.tar.bz2  
$ cp evtest-1.25.tar.bz2 /home/treego/PROJECT/temp2/wisol/freescale-imx6/work/Yocto/fsl-release-  
bsp/downloads/evtest-1.25.tar.bz2  
$ touch /home/treego/PROJECT/temp2/wisol/freescale-imx6/work/Yocto/fsl-release-  
bsp/downloads/evtest-1.25.tar.bz2.done
```

7) 다시 컴파일을 진행 합니다.

```
$ bitbake fsl-image-fb  
Loading cache: 100%  
|#####|  
##| ETA: 00:00:00  
Loaded 2005 entries from dependency cache.  
Parsing recipes: 100%  
|#####|  
Time: 00:00:00
```

Parsing of 1605 .bb files complete (1604 cached, 1 parsed). 2004 targets, 160 skipped, 0 masked, 0 errors.

NOTE: Resolving any missing task queue dependencies

NOTE: multiple providers are available for runtime libgl-mesa-dev (mesa, mesa-gl)

NOTE: consider defining a PREFERRED_PROVIDER entry to match libgl-mesa-dev

NOTE: multiple providers are available for jpeg (jpeg, libjpeg-turbo)

NOTE: consider defining a PREFERRED_PROVIDER entry to match jpeg

Build Configuration:

BB_VERSION = "1.20.0"

BUILD_SYS = "x86_64-linux"

NATIVELSBSTRING = "Ubuntu-12.04"

TARGET_SYS = "arm-poky-linux-gnueabi"

MACHINE = "imx6qsabresd"

DISTRO = "poky"

DISTRO_VERSION = "1.5.1"

TUNE_FEATURES = "armv7a vfp neon callconvention-hard cortexa9"

TARGET_FPU = "vfp-neon"

meta

meta-yocto = "(nobranch):bee7e3756adf70edaeabe9d43166707aab84f581"

meta-oe = "(nobranch):eb4563b83be0a57ede4269ab19688af6baa62cd2"

meta-fsl-arm = "(nobranch):af392c22bf6b563525ede4a81b6755ff1dd2c1c6"

meta-fsl-arm-extra = "(nobranch):07ad83db0fb67c5023bd627a61efb7f474c52622"

meta-fsl-demos = "(nobranch):5a12677ad000a926d23c444266722a778ea228a7"

meta-fsl-arm

meta-fsl-demos = "(nobranch):16c911d80ade96702e3c42ce97f1d69069576bdc"

meta-browser = "(nobranch):fc3969f63bda343c38c40a23f746c560c4735f3e"

meta-gnome

meta-networking = "(nobranch):eb4563b83be0a57ede4269ab19688af6baa62cd2"

NOTE: Preparing runqueue

NOTE: Executing SetScene Tasks

NOTE: Executing RunQueue Tasks

WARNING: Ittng-modules: no modules were created; this may be due to CONFIG_TRACEPOINTS not being enabled in your kernel.

WARNING: Failed to fetch URL

http://ftp.de.debian.org/debian/pool/main/m/mklibs/mklibs_0.1.38.tar.gz, attempting MIRRORS if available

```
WARNING: nbench-byte: No generic license file exists for: freely in any provider
WARNING: nbench-byte: No generic license file exists for: distributable in any provider
NOTE: Tasks Summary: Attempted 4040 tasks of which 2452 didn't need to be rerun and all
succeeded.
```

```
Summary: There were 4 WARNING messages shown.
```

컴파일한 이미지는 **"/.imx6q-yocto/tmp/deploy/images/imx6qsabresd/"** 위치에 존재 합니다.

2. 툴 체인 설치 방법

1) 이전에 받은 Yocto 소스 위치에서 " bitbake meta-toolchain" 으로 Toolchain을 다운 받습니다.

```
$ bitbake meta-toolchain
Loading cache: 100%
|#####|
##| ETA: 00:00:00
Loaded 2005 entries from dependency cache.
NOTE: Resolving any missing task queue dependencies

Build Configuration:
BB_VERSION      = "1.20.0"
BUILD_SYS       = "x86_64-linux"
NATIVELSBSTRING = "Ubuntu-12.04"
TARGET_SYS      = "arm-poky-linux-gnueabi"
MACHINE         = "imx6qsabresd"
DISTRO          = "poky"
DISTRO_VERSION  = "1.5.1"
TUNE_FEATURES   = "armv7a vfp neon callconvention-hard cortexa9"
TARGET_FPU      = "vfp-neon"
meta
meta-yocto      = "(nobranch):bee7e3756adf70edaeabe9d43166707aab84f581"
meta-oe         = "(nobranch):eb4563b83be0a57ede4269ab19688af6baa62cd2"
meta-fsl-arm    = "(nobranch):af392c22bf6b563525ede4a81b6755ff1dd2c1c6"
```

```
meta-fsl-arm-extra = "(nobranch):07ad83db0fb67c5023bd627a61efb7f474c52622"
meta-fsl-demos     = "(nobranch):5a12677ad000a926d23c444266722a778ea228a7"
meta-fsl-arm
meta-fsl-demos     = "(nobranch):16c911d80ade96702e3c42ce97f1d69069576bdc"
meta-browser       = "(nobranch):fc3969f63bda343c38c40a23f746c560c4735f3e"
meta-gnome
meta-networking    = "(nobranch):eb4563b83be0a57ede4269ab19688af6baa62cd2"
```

NOTE: Preparing runqueue

NOTE: Executing SetScene Tasks

NOTE: Executing RunQueue Tasks

WARNING: QA Issue: gcc-cross-canadian-arm: found library in wrong location:

```
/opt/poky/1.5.1/sysroots/x86_64-pokysdk-linux/usr/libexec/arm-poky-linux-gnueabi/gcc/arm-poky-
linux-gnueabi/4.8.1/liblto_plugin.so.0.0.0
```

```
gcc-cross-canadian-arm: found library in wrong location: /opt/poky/1.5.1/sysroots/x86_64-pokysdk-
linux/usr/libexec/arm-poky-linux-gnueabi/gcc/arm-poky-linux-gnueabi/4.8.1/liblto_plugin.so.0
```

```
gcc-cross-canadian-arm: found library in wrong location: /opt/poky/1.5.1/sysroots/x86_64-pokysdk-
linux/usr/libexec/arm-poky-linux-gnueabi/gcc/arm-poky-linux-gnueabi/4.8.1/liblto_plugin.so
```

NOTE: Tasks Summary: Attempted 1827 tasks of which 1059 didn't need to be rerun and all succeeded.

Summary: There was 1 WARNING message shown.

2) 완료가 되면, " tmp/deploy/sdk/" 폴더가 생성이 되고, "tmp/deploy/sdk/" 폴더위치에 하나의 스크립트 파일이 존재합니다.

```
poky-eglibc-x86_64-meta-toolchain-cortexa9hf-vfp-neon-toolchain-1.5.1.sh
```

3) 스크립트 파일을 실행합니다.

```
$ ./poky-eglibc-x86_64-meta-toolchain-cortexa9hf-vfp-neon-toolchain-1.5.1.sh
```

```
Enter target directory for SDK (default: /opt/poky/1.5.1):
```

```
You are about to install the SDK to "/opt/poky/1.5.1". Proceed[Y/n]?
```

```
[sudo] password for treego:
```

```
Extracting SDK...done
```

```
Setting it up...done
```

```
SDK has been successfully set up and is ready to be used.
```

4) 완료가 되면, "/opt/poky/1.5.1/" 에 SDK 및 toolchain이 설치가 됩니다.

" /opt/poky/1.5.1/sysroots/x86_64-pokysdk-linux/usr/bin/arm-poky-linux-gnueabi" 위치에 arm용
툴체인이 설치가 됩니다.

```
treego@treego-C2SBA: /opt/poky/1.5.1/sysroots/x86_64-pokysdk-linux/usr/bin/arm-poky-linux-gnueabi$ ls
arm-poky-linux-gnueabi-addr2line  arm-poky-linux-gnueabi-gcc-ar      arm-poky-linux-gnueabi-nm
arm-poky-linux-gnueabi-ar         arm-poky-linux-gnueabi-gcc-nm     arm-poky-linux-gnueabi-objcopy
arm-poky-linux-gnueabi-as        arm-poky-linux-gnueabi-gcc-ranlib arm-poky-linux-gnueabi-objdump
arm-poky-linux-gnueabi-c++filt   arm-poky-linux-gnueabi-gcov       arm-poky-linux-gnueabi-ranlib
arm-poky-linux-gnueabi-cpp       arm-poky-linux-gnueabi-gdb        arm-poky-linux-gnueabi-readelf
arm-poky-linux-gnueabi-elfedit   arm-poky-linux-gnueabi-gprof      arm-poky-linux-gnueabi-size
arm-poky-linux-gnueabi-g++       arm-poky-linux-gnueabi-ld         arm-poky-linux-gnueabi-strings
arm-poky-linux-gnueabi-gcc       arm-poky-linux-gnueabi-ld.bfd     arm-poky-linux-gnueabi-strip
```

3. Kernel, uboot 소스 추출 및 컴파일 방법

3.1. U-boot

1) uboot소스 위치는 아래에 있습니다. 소스 파일을 원하는 위치에 복사를 합니다.

```
Uboot 소스 위치 "imx6q-yocto/tmp/work/imx6qsabresd-poky-linux-gnueabi/u-boot-  
imx/2013.04-r0/git "
```

2 복사한 u-boot 소스 위치에서, "build_uboot" 스크립트 파일을 생성 합니다.

```
$ vi build_uboot
#!/bin/sh

export ARCH=arm
export CROSS_COMPILE=arm-poky-linux-gnueabi-
export PATH=/opt/poky/1.5.1/sysroots/x86_64-pokysdk-linux/usr/bin/arm-poky-linux-gnueabi:$PATH

KERNEL_IMAGE=uImage

# Default kernel configurations
KERNEL_CONFIG=$2
```

```

INSTALL_BINDIR=../image
export LOADADDR=0x10008000
DTB_FILENAME=imx6q-sabresd.dtb

#{
CPU_JOB_NUM=$(grep processor /proc/cpuinfo | awk '{field=$NF};END{print field+2}')
START_TIME=`date +%s`
#sudo apt-get install libncurses5-dev
case "$1" in
clean)
    echo make -j$CPU_JOB_NUM mrproper
    cp .config arch/arm/configs/$KERNEL_CONFIG
    cp .config config.sav
    make -j$CPU_JOB_NUM mrproper
    ;;
config)
    sudo apt-get install libncurses5-dev
    echo make -j$CPU_JOB_NUM menuconfig
    make -j$CPU_JOB_NUM menuconfig
    ;;
defconfig)
    if [ "$2" ]; then
        KERNEL_CONFIG=$2
    fi
    echo make -j$CPU_JOB_NUM $KERNEL_CONFIG
    make -j$CPU_JOB_NUM $KERNEL_CONFIG
    ;;
all|*)
    echo make -j$CPU_JOB_NUM uImage
    make -j$CPU_JOB_NUM uImage
    make $DTB_FILENAME
    if [ $? != 0 ]; then
        exit 1
    fi
    if [ "$2" ]; then
        INSTALL_BINDIR=$2
    fi
    if [ $INSTALL_BINDIR ]; then

```

```

echo cp -a arch/arm/boot/$KERNEL_IMAGE $INSTALL_BINDIR/$KERNEL_IMAGE
cp -a arch/arm/boot/$KERNEL_IMAGE $INSTALL_BINDIR/$KERNEL_IMAGE
echo cp -a arch/arm/boot/dts/$DTB_FILENAME $INSTALL_BINDIR/$KERNEL_IMAGE
cp -a arch/arm/boot/dts/$DTB_FILENAME $INSTALL_BINDIR/$KERNEL_IMAGE

fi
if [ $INSTALL_BINDIR2 ]; then
    echo cp -a arch/arm/boot/$KERNEL_IMAGE $INSTALL_BINDIR2/$KERNEL_IMAGE
    cp -a arch/arm/boot/$KERNEL_IMAGE $INSTALL_BINDIR2/$KERNEL_IMAGE
fi
;;
esac

END_TIME=`date +%s`
echo "Total compile time is $(((END_TIME-$START_TIME)/60)) minutes $(((END_TIME-$START_TIME)%60)) seconds"
#} 2>&1 |tee b.out

```

3 만든 스크립트를 이용해서, 컴파일을 합니다.

```
$ ./build_uboot config
```

```
$ ./build_uboot
```

3.2. Kernel

1) kernel 소스 위치는 아래에 있습니다. 소스 파일을 원하는 위치에 복사를 합니다.

```
Kernel 소스 위치 "imx6q-yocto/tmp/work/imx6qsabresd-poky-linux-gnueabi/linux-imx/3.10.17-r0/git/"
```

2) 복사한 Kernel 위치에서, "build_kernel" 스크립트 파일을 생성 합니다.

```
$ vi build_kernel
```

```
#!/bin/sh
```

```
export ARCH=arm
```

```
export CROSS_COMPILE=arm-poky-linux-gnueabi-
```

```
export PATH=/opt/poky/1.5.1/sysroots/x86_64-pokysdk-linux/usr/bin/arm-poky-linux-gnueabi:$PATH
```

```
KERNEL_IMAGE=uImage
```



```

# Default kernel configurations
KERNEL_CONFIG=$2

INSTALL_BINDIR=./image

#{
CPU_JOB_NUM=$(grep processor /proc/cpuinfo | awk '{field=$NF};END{print field+2}')
START_TIME=`date +%s`
#sudo apt-get install libncurses5-dev
case "$1" in
clean)
    echo make -j$CPU_JOB_NUM mrproper
    cp .config arch/arm/configs/$KERNEL_CONFIG
    cp .config config.sav
    make -j$CPU_JOB_NUM mrproper
    ;;
config)
    sudo apt-get install libncurses5-dev
    echo make -j$CPU_JOB_NUM menuconfig
    make -j$CPU_JOB_NUM menuconfig
    ;;
defconfig)
    if [ "$2" ]; then
        KERNEL_CONFIG=$2
    fi
    echo make -j$CPU_JOB_NUM $KERNEL_CONFIG
    make -j$CPU_JOB_NUM $KERNEL_CONFIG
    ;;
all|*)
    echo make -j$CPU_JOB_NUM uImage
    make -j$CPU_JOB_NUM uImage
    if [ $? != 0 ]; then
        exit 1
    fi
    if [ "$2" ]; then
        INSTALL_BINDIR=$2
    fi

```

```

if [ $INSTALL_BINDIR ] ; then
    echo cp -a arch/arm/boot/$KERNEL_IMAGE $INSTALL_BINDIR/$KERNEL_IMAGE
    cp -a arch/arm/boot/$KERNEL_IMAGE $INSTALL_BINDIR/$KERNEL_IMAGE
fi
if [ $INSTALL_BINDIR2 ] ; then
    echo cp -a arch/arm/boot/$KERNEL_IMAGE $INSTALL_BINDIR2/$KERNEL_IMAGE
    cp -a arch/arm/boot/$KERNEL_IMAGE $INSTALL_BINDIR2/$KERNEL_IMAGE
fi

;;
esac

END_TIME=`date +%s`
echo "Total compile time is $(((END_TIME-$START_TIME)/60)) minutes $(((END_TIME-$START_TIME)%60)) seconds"

```

3) 컴파일을 하면, 에러가 발생이 됩니다.

```

$ ./build_kernel defconfig imx_v7_defconfig
$ ./build_kernel
CHK    include/generated/uapi/linux/version.h
CHK    include/generated/utsrelease.h
make[1]: `include/generated/mach-types.h'는 이미 갱신되었습니다.
CC     scripts/mod/devicetable-offsets.s
CALL   scripts/checksyscalls.sh
GEN     scripts/mod/devicetable-offsets.h
HOSTCC  scripts/mod/file2alias.o
HOSTLD  scripts/mod/modpost
CHK     include/generated/compile.h
CHK     kernel/config_data.h
Kernel: arch/arm/boot/Image is ready
LZO     arch/arm/boot/compressed/piggy.lzo
AS      arch/arm/boot/compressed/piggy.lzo.o
LD      arch/arm/boot/compressed/vmlinux
OBJCOPY arch/arm/boot/zImage
Kernel: arch/arm/boot/zImage is ready
multiple (or no) load addresses:
This is incompatible with uImages

```

Specify LOADADDR on the commandline to build an uImage

```
make[1]: *** [arch/arm/boot/uImage] 오류 1
```

```
make: *** [uImage] 오류 2
```

4) uImage는 zImage와 다르게, 커널 로딩 주소를 갖는데, 정의가 되지 않아서 생기는 에러입니다. 아래 파일 하나를 생성 하면 됩니다.

```
$ vi arch/arm/mach-imx/Makefile.boot
```

```
zreladdr-$(CONFIG_SOC_IMX6Q) := 0x10008000
```

```
params_phys-$(CONFIG_SOC_IMX6Q) := 0x10000100
```

```
initrd_phys-$(CONFIG_SOC_IMX6Q) := 0x10800000
```

4. Image Write 방법

1) Micro SD를 삽입하고, 장치 이름을 확인 합니다.

```
[ 7456.857578] sd 4:0:0:0: [sdc] 15644672 512-byte logical blocks: (8.01 GB/7.45 GiB)
```

```
[ 7456.859072] sd 4:0:0:0: [sdc] No Caching mode page present
```

```
[ 7456.859076] sd 4:0:0:0: [sdc] Assuming drive cache: write through
```

```
[ 7456.861822] sd 4:0:0:0: [sdc] No Caching mode page present
```

```
[ 7456.861825] sd 4:0:0:0: [sdc] Assuming drive cache: write through
```

```
[ 7456.863091] sdc:
```

2) 아래 명령으로 SD에 이미지 파일을 write할 수 있습니다.

```
sudo dd if=u-boot.imx of=/dev/sdc bs=512 seek=2; sync
```

```
sudo dd if=uImage of=/dev/sdc bs=512 seek=2048 conv=fsync
```

```
sudo dd if=imx6q-sabresd.dtb of=/dev/sdc bs=512 seek=20480 conv=fsync
```

Rootfs 만드는 소스를 찾지 못해서, Yocto 프로젝트 컴파일시에 나온 rootfs 이미지 파일을 복사해서, write를 진행 했습니다.

3) sd에 파티션을 설정합니다.

```
Command (m for help): p
```

```
Disk /dev/sdc: 7948 MB, 7948206080 bytes
```

245 heads, 62 sectors/track, 1021 cylinders, total 15523840 sectors

Units = sectors of 1 * 512 = 512 bytes

Sector size (logical/physical): 512 bytes / 512 bytes

I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk identifier: 0xd29dc410

Device	Boot	Start	End	Blocks	Id	System
--------	------	-------	-----	--------	----	--------

Command (m for help): n

Partition type:

p primary (0 primary, 0 extended, 4 free)

e extended

Select (default p): p

Partition number (1-4, default 1): 1

First sector (2048-15523839, default 2048): 40000

Last sector, +sectors or +size{K,M,G} (40000-15523839, default 15523839):

Using default value 15523839

Command (m for help): p

Disk /dev/sdc: 7948 MB, 7948206080 bytes

245 heads, 62 sectors/track, 1021 cylinders, total 15523840 sectors

Units = sectors of 1 * 512 = 512 bytes

Sector size (logical/physical): 512 bytes / 512 bytes

I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk identifier: 0xd29dc410

Device	Boot	Start	End	Blocks	Id	System
/dev/sdc1		40000	15523839	7741920	83	Linux

Command (m for help): w

The partition table has been altered!

Calling ioctl() to re-read partition table.

Syncing disks.

4) 설정한 파티션을 포맷 합니다.

```
$ sudo mkfs.ext4 /dev/sdc1
```

```
mke2fs 1.42 (29-Nov-2011)
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
Stride=0 blocks, Stripe width=0 blocks
484800 inodes, 1935480 blocks
96774 blocks (5.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=1983905792
60 block groups
32768 blocks per group, 32768 fragments per group
8080 inodes per group
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632

Allocating group tables: done
Writing inode tables: done
Creating journal (32768 blocks): done
Writing superblocks and filesystem accounting information: done
```

5) 복사한 rootfs 이미지 파일을 write를 합니다.

```
$ mkdir temp
```

```
$ sudo mount /dev/sdc1 temp
```

```
$ sudo tar xf fsl-image-fb-imx6qsabresd-20140925044842.rootfs.tar.bz2 -C temp/
```

```
$ sync
```

```
$ sudo umount /dev/sdc1
```

6) SD로 부팅 후, uboot prompt 상에서 환경변수를 수정 합니다.

```
U-Boot > setenv loadaddr 0x12000000
```

```
U-Boot > setenv fdt_addr 0x18000000
```

```
U-Boot > setenv fdt_high 0xffffffff
```

```
U-Boot > setenv bootargs_base 'setenv bootargs console=ttyMxc0,115200'
```

```
U-Boot > setenv bootargs_mmc 'setenv bootargs ${bootargs} root=/dev/mmcblk0p1 init=/sbin/init
rootwait rw video=mxcbf1:dev=ldb,LDB-XGA,if=RGB666
```

```
video=mxcfb0:dev=hdm,1920x1080M@60,if=RGB24'
```

```
U-Boot > setenv bootcmd_mmc 'run bootargs_base bootargs_mmc;mmc dev 1;mmc read ${loadaddr} 0x800 0x8000;mmc read ${fdt_addr} 0x5000 0x800;bootm ${loadaddr} - ${fdt_addr}'
```

```
U-Boot > setenv bootcmd 'run bootcmd_mmc'
```

```
U-Boot > saveenv
```

```
U-Boot > run bootcmd
```