

Quest 1: 개발환경 구축 (Developer Package 빌드) 작성자 : 칩헤드

안녕하세요. 퀘스트 1단계인 플랫폼 보드 없이 개발환경을 구축한 결과를 스크린샷으로 올립니다.

* 요약:

우분투 18.04 PC 환경에서 부트로더 및 리눅스 커널 소스를 빌드하기 위하여 필요한 의존성 패키지들을 먼저 설치하였습니다.

STM32MP1 보드에서 사용하기 위한 Developer Package를 설치하고나서, 부트로더 (Uboot)와 리눅스 커널 4.19 소스를 정상적으로 컴파일하였습니다.

*** 참고:** 멀티코어로 부트로더 및 리눅스 커널 소스의 컴파일 속도 가속화 방법 소스의 컴파일 속도를 가속화하기 위하여 `-j$(nproc)` 이라는 멀티코어 빌드 옵션을 추가하였습니다. STM32MP1 메뉴얼에 이 옵션을 추가 가이드하면 좋겠습니다.

예제: `make ARCH=arm O="$PWD/./build" multi_v7_defconfig fragment*.config -j$(nproc)`

* 실행 결과 스크린샷:

1. 리눅스 커널 소스 빌드 결과:

```

nux dtbs LOADADDR=0xC2000040 O="$PWD/./build" -j`nproc`
make[1]: 디렉터리 '/work/stm32mp1-quest/stm32mp1-openstlinux-20-02-19/sources/arm-ostl-linux-gnueabi/linux-stm32mp-4.19-r0/build' 들 어 감
GEN      ./Makefile
Using /work/stm32mp1-quest/stm32mp1-openstlinux-20-02-19/sources/arm-ostl-linux-gnueabi/linux-stm32mp-4.19-r0/linux-4.19.94 as source for kernel
CALL     /work/stm32mp1-quest/stm32mp1-openstlinux-20-02-19/sources/arm-ostl-linux-gnueabi/linux-stm32mp-4.19-r0/linux-4.19.94/scripts/checksyscalls.sh
CHK      include/generated/compile.h
make[1]: 'vmlinux'은 (는) 이미 업데이트되었습니다.
Kernel: arch/arm/boot/Image is ready
Kernel: arch/arm/boot/zImage is ready
Kernel: arch/arm/boot/uImage is ready
make[1]: 디렉터리 '/work/stm32mp1-quest/stm32mp1-openstlinux-20-02-19/sources/arm-ostl-linux-gnueabi/linux-stm32mp-4.19-r0/build' 나 감
(base) invain@ul1804:/work/stm32mp1-quest/stm32mp1-openstlinux-20-02-19/sources/arm-ostl-linux-gnueabi/linux-stm32mp-4.19-r0/linux-4.19.94$ ls -al ./build/install_artifact/boot/
total 100
drwxrwxr-x 2 invain invain 4096 4월 12 14:45 .
drwxrwxr-x 4 invain invain 4096 4월 12 14:44 ..
-rw-rw-r-- 1 invain invain 18789 4월 12 14:45 stm32429i-eval.dtb
-rw-rw-r-- 1 invain invain 14974 4월 12 14:45 stm32746g-eval.dtb
-rw-rw-r-- 1 invain invain 16430 4월 12 14:45 stm32f429-disco.dtb
-rw-rw-r-- 1 invain invain 17869 4월 12 14:45 stm32f469-disco.dtb
-rw-rw-r-- 1 invain invain 14858 4월 12 14:45 stm32f746-disco.dtb
-rw-rw-r-- 1 invain invain 15081 4월 12 14:45 stm32f769-disco.dtb
-rw-rw-r-- 1 invain invain 11088 4월 12 14:45 stm32h743i-disco.dtb
-rw-rw-r-- 1 invain invain 11680 4월 12 14:45 stm32h743i-eval.dtb
-rw-rw-r-- 1 invain invain 71751 4월 12 14:45 stm32mp157a-dk1.dtb
-rw-rw-r-- 1 invain invain 73626 4월 12 14:45 stm32mp157c-dk2-a7-examples.dtb
-rw-rw-r-- 1 invain invain 74162 4월 12 14:45 stm32mp157c-dk2-m4-examples.dtb
-rw-rw-r-- 1 invain invain 73578 4월 12 14:45 stm32mp157c-dk2.dtb
-rw-rw-r-- 1 invain invain 68471 4월 12 14:45 stm32mp157c-ed1.dtb
-rw-rw-r-- 1 invain invain 78340 4월 12 14:45 stm32mp157c-ev1-a7-examples.dtb
-rw-rw-r-- 1 invain invain 78673 4월 12 14:45 stm32mp157c-ev1-m4-examples.dtb
-rw-rw-r-- 1 invain invain 78033 4월 12 14:45 stm32mp157c-ev1.dtb
-rw-rw-r-- 1 invain invain 6509120 4월 12 14:45 uImage
(base) invain@ul1804:/work/stm32mp1-quest/stm32mp1-openstlinux-20-02-19/sources/arm-ostl-linux-gnueabi/linux-stm32mp-4.19-r0/linux-4.19.94$ w && whoami && uname -a
14:48:22 up 7:17, 3 users, load average: 0.41, 0.40, 0.71
USER      TTY      FROM          LOGIN@   IDLE   JCPU   PCPU   WHAT
invain    tty7     x0            07:30    7:17m  6:31   0.78s  mate-session
invain    pts/0    192.168.219.1 13:24    6:00s  1.05s  0.00s  w
invain    pts/1    192.168.219.1 13:34    1:11m  0.10s  0.10s  -bash
invain
Linux ul1804 4.15.0-96-generic #97-Ubuntu SMP Wed Apr 1 03:25:46 UTC 2020 x86_64 x86_64 x86_64 GNU/Linux
(base) invain@ul1804:/work/stm32mp1-quest/stm32mp1-openstlinux-20-02-19/sources/arm-ostl-linux-gnueabi/linux-stm32mp-4.19-r0/linux-4.19.94$

```

2. 리눅스 커널의 DTB (Device Tree Binary)와 Artifact 의 결과:

```

(base) invain@u1804:/work/stm32mp1-quest/stm32mp1-openstlinux-20-02-19/sources/arm-ostl-linux-gnueabi/linux-stm32mp-4.19-r0/build/arch/arm/boots$ lsb_release -a
No LSB modules are available.
Distributor ID: Ubuntu
Description:    Ubuntu 18.04.4 LTS
Release:        18.04
Codename:       bionic
(base) invain@u1804:/work/stm32mp1-quest/stm32mp1-openstlinux-20-02-19/sources/arm-ostl-linux-gnueabi/linux-stm32mp-4.19-r0/build/arch/arm/boots$ tree -P 'vmlinux*|ui mag*|stm32mp*'
-- compressed
|-- vmlinux
|-- vmlinux.lds
-- dts
|-- stm32mp157a-dk1.dtb
|-- stm32mp157c-dk2-a7-examples.dtb
|-- stm32mp157c-dk2-m4-examples.dtb
|-- stm32mp157c-dk2.dtb
|-- stm32mp157c-ed1.dtb
|-- stm32mp157c-ev1-a7-examples.dtb
|-- stm32mp157c-ev1-m4-examples.dtb
|-- stm32mp157c-ev1.dtb
-- uImage

2 directories, 11 files
(base) invain@u1804:/work/stm32mp1-quest/stm32mp1-openstlinux-20-02-19/sources/arm-ostl-linux-gnueabi/linux-stm32mp-4.19-r0/build/arch/arm/boots$ ls ../../../../install_
artifact/lib/modules/4.19.94-gcb0e25784/
build modules.alias modules.builtin modules.dep modules.devname modules.softdep modules.symbols.bin
kernel modules.alias.bin modules.builtin.bin modules.dep.bin modules.order modules.symbols source
(base) invain@u1804:/work/stm32mp1-quest/stm32mp1-openstlinux-20-02-19/sources/arm-ostl-linux-gnueabi/linux-stm32mp-4.19-r0/build/arch/arm/boots$ w && whoami && uname
-a
14:53:59 up 7:23, 3 users, load average: 0.56, 0.40, 0.59
USER      TTY      FROM            LOGIN@   IDLE   JCPU   PCPU   WHAT
invain    tty7     :0              07:30    7:23m  6:36   0.78s  mate-session
invain    pts/0    192.168.219.1   13:24    7:00s  1.28s  0.01s  w
invain    pts/1    192.168.219.1   13:34    1:17m  0.10s  0.10s  -bash
invain
Linux u1804 4.15.0-96-generic #97-Ubuntu SMP Wed Apr 1 03:25:46 UTC 2020 x86_64 x86_64 x86_64 GNU/Linux
(base) invain@u1804:/work/stm32mp1-quest/stm32mp1-openstlinux-20-02-19/sources/arm-ostl-linux-gnueabi/linux-stm32mp-4.19-r0/build/arch/arm/boots$

```

3. 부트로더 U-boot의 빌드 결과:

```

CC      lib/string.o
CC      lib/tables_csum.o
CC      lib/time.o
CC      lib/hexdump.o
CC      lib/uuid.o
CC      lib/rand.o
CC      lib/panic.o
CC      lib/vsprintf.o
CC      lib/strto.o
CC      lib/strmhz.o
LD      lib/built-in.o
CC      examples/standalone/stubs.o
CC      examples/standalone/hello_world.o
LD      examples/standalone/libstubs.o
LD      examples/standalone/hello_world
OBJCOPY examples/standalone/hello_world.srec
OBJCOPY examples/standalone/hello_world.bin
LD      u-boot
OBJCOPY u-boot-nodtb.bin
OBJCOPY u-boot.srec
SYM      u-boot.sym
DTC      arch/arm/dts/stm32mp157c-dk2.dtb
DTC      arch/arm/dts/stm32mp157c-ed1.dtb
DTC      arch/arm/dts/stm32mp157a-dk1.dtb
DTC      arch/arm/dts/stm32mp157c-ev1.dtb
make[2]: 'arch/arm/dts/stm32mp157c-ev1.dtb' is up to date.
SHIPPED dts/dt.dtb
FDTGPREP dts/dt-spl.dtb
CAT      u-boot.dtb.bin
COPY     u-boot.dtb
COPY     u-boot.bin
MKIMAGE  u-boot-stm32
CFGCHK   u-boot.cfo
(base) invain@u1804:/work/stm32mp1/stm32mp1-openstlinux-20-02-19/sources/arm-ostl-linux-gnueabi/u-boot-stm32mp-2018.11-r0/u-boot-2018.11$ w && whoami && uname -a
15:06:29 up 7:36, 3 users, load average: 1.28, 0.52, 0.44
USER      TTY      FROM            LOGIN@   IDLE   JCPU   PCPU   WHAT
invain    tty7     :0              07:30    7:36m  6:46   0.79s  mate-session
invain    pts/0    192.168.219.1   13:24    4:00s  1.72s  0.01s  w
invain    pts/1    192.168.219.1   13:34    1:29m  0.10s  0.10s  -bash
invain
Linux u1804 4.15.0-96-generic #97-Ubuntu SMP Wed Apr 1 03:25:46 UTC 2020 x86_64 x86_64 x86_64 GNU/Linux
(base) invain@u1804:/work/stm32mp1/stm32mp1-openstlinux-20-02-19/sources/arm-ostl-linux-gnueabi/u-boot-stm32mp-2018.11-r0/u-boot-2018.11$

```

이상.

! 관심 Make 등록

✓ Make 구독하기

※ e4ds make에 등록된 자료는 e4ds와 지식 제공자(기업포함) 이외에는 상업화 용도로 사용할 수 없습니다. 영리 목적 이외의 사용 시 출처를 밝혀야 합니다.