MUSB Linux Driver Configuration

The Linux USB drivers have multiple layers, which are controlled by multiple kernel configurations. This page describe these configurations which are required to enable MUSB in AMSDK 8.0 (Kernel 3.14+), and all Processor Linux SDKs (up to kernel v4.9.x).

Contents

Introduction

The following drivers are required for MUSB, regardless for host-only, device-only, or dual-role mode.

- USB Core Driver
- MUSB Controller Driver
- MUSB Platform Glue Driver
- USB PHY Driver
- CPPI41 DMA Driver (optional)

For MUSB to work in host mode, the USB Class Driver(s) and the corresponding upper layer functional driver(s) are required too. For example, to support USB thumb drive or harddisk, the USB MSC driver and SCSI drivers should be enabled.

And for MUSB to work in device mode, the USB gadget driver(s) is required as well.

Additionally, a (any) gadget driver is required too when the MUSB controller is configured in dual-role mode. (TODO: how to configure the mode in dts)

Configurations

The following table lists the MUSB related drivers, their CONFIG options, and locations under "Device Drivers" in menuconfig.

Drivers	Options	Locations
USB Core	CONFIG_USB_SUPPORT	USB Support
	CONFIG_USB	USB Support Support for Host-side USB
MUSB Controller	CONFIG_USB_MUSB_HDRC CONFIG_USB_MUSB_DUAL_ROLE	USB Support Inventra Highspeed Dual Role MUSB Mode Selection (Dual Role mode)
MUSB Glue	CONFIG_USB_MUSB_DSPS (for AM335x only)	USB Support Inventra Highspeed Dual Role Platform Glue Layer TI DSPS platforms
	CONFIG_USB_MUSB_DA8XX (for OMAPL138 only)	USB Support Inventra Highspeed Dual Role Platform Glue Layer DA8xx/OMAP-L1x
USB PHY	CONFIG_NOP_USB_XCEIV CONFIG_AM335X_PHY_USB (for AM335x only)	USB Support USB Physical Layer drivers NOP USB Transceiver Driver AM335x USB PHY Driver .
	CONFIG_NOP_USB_XCEIV (for OMAPL138 only)	USB Support USB Physical Layer drivers NOP USB Transceiver Driver .
CPPI41 DMA	CONFIG_DMADEVICES CONFIG_TI_CPPI41	DMA Engine support CPPI 4.1 DMA support
	CONFIG_USB_TI_CPPI41_DMA	USB Support Inventra Highspeed Dual Role MUSB DMA mode TI CPPI 4.1
PIO mode	CONFIG_MUSB_PIO_ONLY	USB Support Inventra Highspeed Dual Role Disable DMA (always use PIO)
USB Class	CONFIG_*	USB Support *
USB Gadget	CONFIG_USB_GADGET CONFIG_*	USB Support USB Gadget Support USB Gadget Drivers *

Kernel Config Merge Script

The kernel config merge script (scripts/kconfig/merge_config.sh) is a convenient tool to modify kernel config file. Doing the following steps enables MUSB drivers in kernel for AM335x.

- Put the following content into a file, for example, called omap2plus-extra.cfg

```
# MUSB
CONFIG_USB_MUSB_HDRC=m
CONFIG_USB_MUSB_HOST=n
CONFIG_USB_MUSB_GADGET=n
CONFIG_USB_MUSB_DUAL_ROLE=y
CONFIG_USB_MUSB_TUSB6010=n
CONFIG_USB_MUSB_OMAP2PLUS=n
CONFIG_USB_MUSB_AM35X=n
CONFIG_USB_MUSB_DSPS=m
CONFIG_USB_MUSB_UX500=n
CONFIG_USB_TI_CPPI41_DMA=y
CONFIG_MUSB_PIO_ONLY=n

# MISC to avoid prompt
CONFIG_USB_SISUSBVGA=n
```

- generate .config

```
$ make omap2plus_defconfig
```

- merge MUSB options

```
$ scripts/kconfig/merge_config.sh -m .config omap2plus-extra.cfg
```

Build Drivers into Kernel Image

To build all MUSB related drivers into kernel, use one of the following three options.

1. Set the following config options to 'y' instead of 'm' in .config.

```
      CONFIG_USB_MUSB_HDRC=y
      CONFIG_USB_MUSB_DSPS=y
      CONFIG_AM335X_PHY_USB=y (for AM335x only)
```

2. Set the related config options in the table above to <*> instead of '<M>' in menuconfig.

3. Set the corresponding options to 'y', then use merge_config.sh script mentioned in the previous section.

Known Issue: the built-in gadget driver is not functional. But a workaround is to disable CPPI41 DMA and use PIO mode, or build gadget drivers as kernel module.

Notes

- Config option USB_OTG is not required for MUSB dual-role mode.
- Don't enable Config option USB_OTG_WHITELIST, Unless you know what this option means.

Archived

Sitara Linux SDK 08.00.00.00 (http://processors.wiki.ti.com/index.php/?title=MUSB_Linux_Driver_Configuration&oldid=198200)

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