**Design Document for Ether / L2 Switch Driver**

 

# Outline

This document describes the Ethernet/L2 Switch driver in Linux kernel of MVF TOWER BOARD (XTWR-VF600) with MVF SoC.

# Existing code to be changed

## Source

* Ether driver

i.MX 6Solo SABRE-A BSP

drivers/net/fec.c / fec.h

drivers/net/fec\_1588.c / fec\_1588.h

arm/arm/plat-mxc/devices/platfor-fec.c

arch/arm/mach-mx6/mx6\_fec.c

* L2 Switch driver

Modelo BSP

drivers/net/modelo\_switch.c / modelo\_switch.h

arch/m68k/coldfire/m5441x/l2switch.c

arch/m68k/include/asm/mcfsiwtch.h

include/linux/fsl\_devices.h

## Modifications

* Ether driver

drivers/net/fec.c/fec.h

1. No register setting for GIGA BIT of FEC

Set conditional compilation and do not build with MVF. Use ifndef and make the following change.

if (fep->phy\_dev && (fep->phy\_dev->supported &

(SUPPORTED\_1000baseT\_Half | SUPPORTED\_1000baseT\_Full)) &&

fep->phy\_interface == PHY\_INTERFACE\_MODE\_RGMII &&

fep->phy\_dev->speed == SPEED\_1000)

val |= (0x1 << 5)

to

**#ifndef CONFIG\_ARCH\_MVF**

if (fep->phy\_dev && (fep->phy\_dev->supported &

(SUPPORTED\_1000baseT\_Half | SUPPORTED\_1000baseT\_Full)) &&

fep->phy\_interface == PHY\_INTERFACE\_MODE\_RGMII &&

fep->phy\_dev->speed == SPEED\_1000)

val |= (0x1 << 5)

**#endif**

1. Add conditional compilation for IEEE1588

Adjust to be the same conditional compilation as CONFIG\_ARCH\_MX6 when IEEE1588 is enabled.

Within fec\_restart function

#if defined(CONFIG\_SOC\_IMX28) || defined(CONFIG\_ARCH\_MX6) 🡪 #if defined(CONFIG\_SOC\_IMX28) || defined(CONFIG\_ARCH\_MX6) || defined(CONFIG\_ARCH\_MVF)

\* Supporting EN1588bit Enable

drivers/net/fec\_1588.c / fec\_1588.h

1. Adjust to be the same conditional compilation as CONFIG\_ARCH\_MX6.

defined(CONFIG\_ARCH\_MX6) ->

defined(CONFIG\_ARCH\_MX6) || defined(CONFIG\_ARCH\_MVF)

arm/arm/plat-mxc/devices/platfor-fec.c

1. Add resource definition as below

#ifdef CONFIG\_ARCH MVF

const struct imx\_fec\_data mvf\_fec\_data \_\_initconst =

imx\_fec\_data\_entry\_single(MVF);

#endif

Define below (to be macro extended) in system header.

MVF\_FEC\_BASE\_ADDR: Base address

MVF\_INT\_FEC: Interrupt number (ENET\_MAC0)

arm/arm/mach-mvf/mvf\_fec.c

1. Define initialization of FEC resource

Add resource initialization same as arch/arm/mach-mx6/mx6\_fec.c.

Also add an entry so that below will be called at the board initialization.

void \_\_init mvf\_init\_fec(struct fec\_platform\_data fec\_data)

* L2 Switch driver

Two files below have implementation to directly change register.

Therefore with MVF, it is adjusted that such is done after ioremap. Also, adopt the porting that makes minimum change in source code.

arch/mach-mvf/mvf\_l2switch.c (TBA)

1. Port resource definitions from Modelo BSP to MVF BSP.

Replace all the name “coldfire” in the file (except indicate the file source) with MVF.

1. Set up as follows.

Do not use this file for GPIO settings.

For direct reference of register, adjust to use an address after ioremap.

Define FEC address and Switch address with platform struct of this file.

drivers/net/modelo\_switch.c / modelo\_switch.h

1. Port from Modelo BSP to MVF BSP.
2. Set up as follows.

Ioremap each IP address defined by Platform struct and modify to use such addresses. (FEC IP/Switch IP/Address Table)

Modify Tx/rx/open/close to the struct that supports net\_device\_ops.

Write new register.

Integrate definitions dispersed in drivers/net/modelo\_switch.h and arch/m68k/include/asm/mcfsiwtch.h.

include/linux/fsl\_devices.h

1. Add platform struct for Switch

# API of new functions

No newly added API since FEC(including 1588 support)/L2 Switch Driver is divert source.

# Expected register settings

## Ether Driver

CPU manual 6.1 indicates that Ethernet(RMII\_CLK) is 50MHz, and according to the Table31-10 of the manual, set MII\_SPEED Field of ENET\_MSCR as 0x9.

\* However, fec.c of BSP has the following and it may not be 0x9 due to a bug.

fep->phy\_speed=DIV\_ROUND\_UP(clk\_get\_rate(fep->clk),

(FEC\_ENET\_MII\_CLK << 2)) << 1;

# Expected functionality and usage

L2Switch driver complies with the format of modelo\_switch command.

# Any other pertinent information

None