Patrick Lin - A20666

寄件者:	Patrick Lin - A20666
寄件日期:	2020年2月13日星期四 上午 11:59
收件者:	Linda Lai - A15540
副本:	Carol Jen - A21523
主旨:	RE: SAM9X60 with UART x12

Hi Linda,

Tried to modify device tree to enable other UART. Here I selected Flexcom1.

Flexcom1 IO0	TXD	PA5	CAN TX/EXT40 TX (PD19)
Flexcom1 IO1	RXD	PA6	CAN RX/EXT40 RX (PD19)

```
aliases {
    i2c0 = &i2c0;
    i2c1 = &i2c1;
    serial1 = &uart1;
    serial2 = &uart2;
};
```

```
flx1: flexcom@f8020000 {
    atmel,flexcom-mode = <ATMEL_FLEXCOM_MODE_USART>;
    status = "okay";

    uart2: serial@200 {
        compatible = "atmel,at91sam9260-usart";
        reg = <0x200 0x200>;
        interrupts = <6 IRQ_TYPE_LEVEL_HIGH 7>;
        clocks = <&pmc PMC_TYPE_PERIPHERAL 6>;
        clock-names = "usart";
        pinctrl-0 = <&pinctrl_flx1_default>;
        pinctrl-names = "default";
        status = "okay";
    };
};
```

```
pinctrl_flx1_default: flx1_uart {
    atmel,pins =
        <AT91_PIOA 5 AT91_PERIPH_A AT91_PINCTRL_NONE
        AT91_PIOA 6 AT91_PERIPH_A AT91_PINCTRL_NONE>;
};
```

The EXT40 TX/RX are shared with CAN. Need to disable CAN1 in device tree.

```
//          can1: can@f8004000 {
//              pinctrl-names = "default";
//              pinctrl-0 = <&pinctrl_can1_rx_tx>;
//              status = "okay";
//          };
```

```
//              can1 {
//                      pinctrl_can1_rx_tx: can1_rx_tx {
//                              atmel,pins =
//                                      <AT91_PIOA 6 AT91_PERIPH_B AT91_PINCTRL_NONE
//                                       AT91_PIOA 5 AT91_PERIPH_B AT91_PINCTRL_NONE
//                                       AT91_PIOD 19 AT91_PERIPH_GPIO AT91_PINCTRL_PULL
//                                       AT91_PIOD 21 AT91_PERIPH_GPIO AT91_PINCTRL_PULL
//                      };
//              };
```

Rebuild kernel and device tree. Update sam9x60ek.itb in sd card. Boot.
Found new UART port. (ttyS2)

```
# ls /dev/ttyS*
/dev/ttyS0  /dev/ttyS1  /dev/ttyS2
#
```

// enable gpio PD19 and set to output with low level.
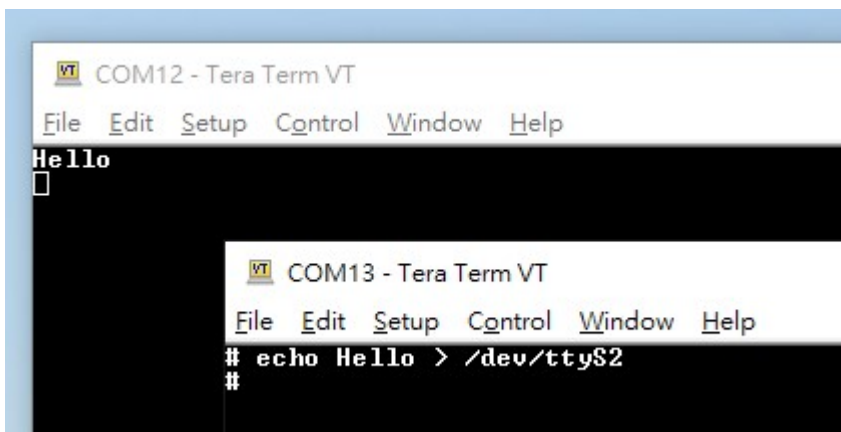# echo 115 > /sys/class/gpio/export
echo "out" > /sys/class/gpio/pioD19/direction
echo 1 > /sys/class/gpio/pioD19/value

// setup UART
stty -F /dev/ttyS2 115200
echo hello > /dev/ttyS2

Done. Simple, right!!!

Best regards,

Patrick Lin

MPU Product Marketing
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Direct: +886 2 2508 8239
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www.microchip.com
www.linux4sam.com

Hi Linda,

After checked last night, it's possible. Few notes.

1. Probably sam9x60 can provide 12+1 UART port (12 UART + 1 debug port) for customer. One will be occupied by ETH0 (in RED)
   Some could be selected by gpio. But some might be in trouble. Might need to modify pcb to remove resistors. (in light blue)

sam9x60 EVK RevB UART Pin Assignment

NAME	Function	PORT	Function in EVK
Debug TX	TXD	PA10	debug port TX to JLINK
Debug RX	RXD	PA9	debug port RX to JLINK
Flexcom0 IO0	TXD	PA0	LCD TWD
Flexcom0 IO1	RXD	PA1	LCD TWCK
Flexcom1 IO0	TXD	PA5	CAN TX/EXT40 TX (PD19)
Flexcom1 IO1	RXD	PA6	CAN RX/EXT40 RX (PD19)
Flexcom2 IO0	TXD	PA7	BT RTS/EXT40 NPCS1
Flexcom2 IO1	RXD	PA8	BT CTS/EXT40 NPCS2
Flexcom3 IO0	TXD	PC22	LCD D22
Flexcom3 IO1	RXD	PC23	LCD D23
Flexcom4 IO0	TXD	PA12	BT CMD/MBUS MOSI/EXT40 MOSI
Flexcom4 IO1	RXD	PA11	BT DAT0/MBUS MISO/EXT40 MISO
Flexcom5 IO0	TXD	PA22	BT TX/MBUS TX (PA29)
Flexcom5 IO1	RXD	PA21	BT RX/MBUS RX (PA29)
Flexcom6 IO0	TXD	PA30	PAC1934 TWD/MBUS TWD/···
Flexcom6 IO1	RXD	PA31	PAC1934 TWCK/MBUS TWCK/···
Flexcom7 IO0	TXD	PC0	LCD D0
Flexcom7 IO1	RXD	PC1	LCD D1
Flexcom8 IO0	TXD	PB4	ETH0 TX
Flexcom8 IO1	RXD	PB5	ETH0 RX
Flexcom9 IO0	TXD	PC8	LCD D8
Flexcom9 IO1	RXD	PC9	LCD D9
Flexcom10 IO0	TXD	PC16	LCD nRST
Flexcom10 IO1	RXD	PC17	LCD D17
Flexcom11 IO0	TXD	PB19	QSPI SCK/EXT40 I2SCK
Flexcom11 IO1	RXD	PB20	QSPI CS/EXT40 I2SWS
Flexcom12 IO0	TXD	PB21	QSPI IO0/EXT40 I2SDIN

Flexcom12 IO1	RXD	PB22	QSPI IO1/EXT40 I2SDOUT

2. Enable MikroBUS UART
The UART in MikroBUS is shared with WILC3000. Switch to MikroBus before use it.
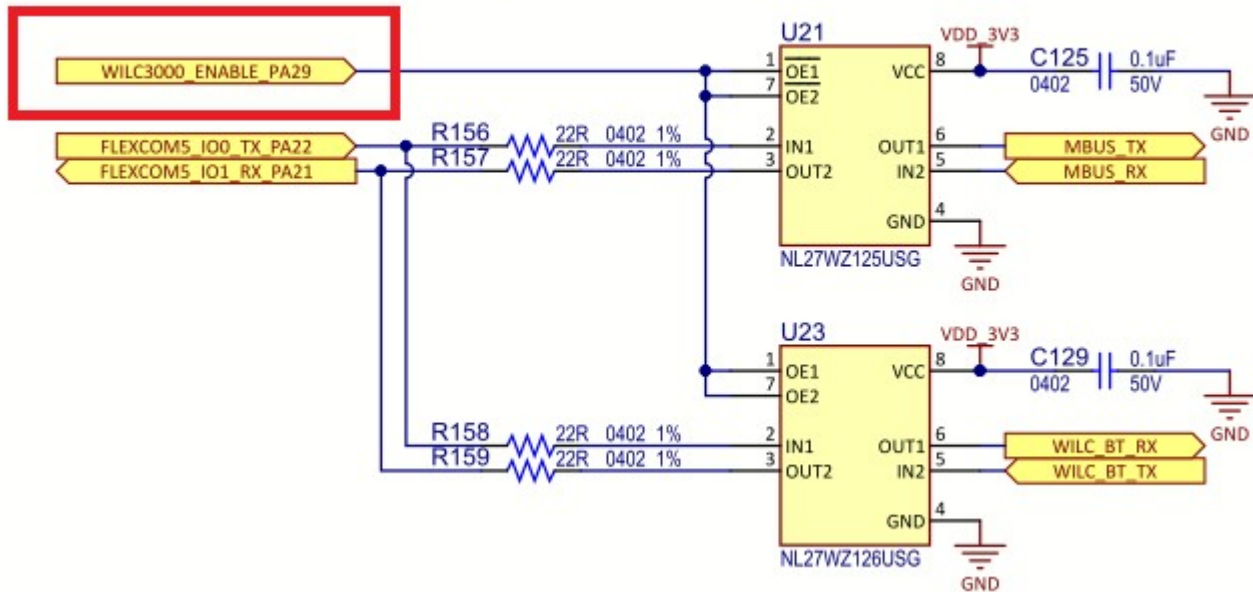
In machine terminal

```
// enable gpio PA29 and set to output with low level
# echo 29 > /sys/class/gpio/export
# echo "out" > /sys/class/gpio/pioA29/direction
# echo 0 > /sys/class/gpio/pioA29/value

// setup UART
# stty -F /dev/ttyS1 115200
# echo hello > /dev/ttyS1
```

ttyS1 has been defined in device tree

```
aliases {
    i2c0 = &i2c0;
    i2c1 = &i2c1;
    serial1 = &uart1;
};
```

```
flx5: flexcom@f0004000 {
    atmel,flexcom-mode = <ATMEL_FLEXCOM_MODE_USART>;
    status = "okay";

    uart1: serial@200 {
        compatible = "atmel,at91sam9260-usart";
        reg = <0x200 0x200>;
        interrupts = <14 IRQ_TYPE_LEVEL_HIGH 7>;
        dmas = <&dma0
            (AT91_XDMAC_DT_MEM_IF(0) | AT91_XDMAC_DT_PER_IF(1) |
             AT91_XDMAC_DT_PERID(10))>,
                <&dma0
                (AT91_XDMAC_DT_MEM_IF(0) | AT91_XDMAC_DT_PER_IF(1) |
             AT91_XDMAC_DT_PERID(11))>;
        dma-names = "tx", "rx";
        clocks = <&pmc PMC_TYPE_PERIPHERAL 14>;
        clock-names = "usart";
        pinctrl-0 = <&pinctrl_flx5_default>;
        pinctrl-names = "default";
        atmel,use-dma-rx;
        atmel,use-dma-tx;
        status = "okay";
    };
};
```

```
pinctrl_flx5_default: flx_uart {
    atmel,pins =
        <AT91_PIOA 7 AT91_PERIPH_C AT91_PINCTRL_NONE
         AT91_PIOA 8 AT91_PERIPH_B AT91_PINCTRL_NONE
         AT91_PIOA 21 AT91_PERIPH_B AT91_PINCTRL_NONE
         AT91_PIOA 22 AT91_PERIPH_B AT91_PINCTRL_NONE>;
};
```

Thanks.

Best regards,

Patrick Lin

MPU Product Marketing
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Direct: +886 2 2508 8239
Email: patrick.lin@microchip.com
www.microchip.com
www.linux4sam.com

From: Linda Lai - A15540 <Linda.Lai@microchip.com>
Sent: Wednesday, February 12, 2020 6:01 PM
To: Patrick Lin - A20666 <Patrick.Lin@microchip.com>
Cc: Carol Jen - A21523 <Carol.Jen@microchip.com>; Casper Chang - A42964 <Casper.Chang@microchip.com>
Subject: RE: SAM9X60 with UART x12

Best regards,

Patrick Lin

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Mobie: +886 937806383
Direct: +886 2 2508 8239
Email: patrick.lin@microchip.com
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From: Linda Lai - A15540 <Linda.Lai@microchip.com>
Sent: Wednesday, February 12, 2020 6:01 PM
To: Patrick Lin - A20666 <Patrick.Lin@microchip.com>
Cc: Carol Jen - A21523 <Carol.Jen@microchip.com>; Casper Chang - A42964 <Casper.Chang@microchip.com>
Subject: RE: SAM9X60 with UART x12

Hi Patrick and Casper,

剛跟客戶通電話
因為客戶蠻急的問明天早上是否方便 co-call？

另外他Ethernet部分10/100 ok, 但還需要 SSL, DHCP等軟體
所以Linux 如果可以應該比較合適

Best Regards
Linda Lai

From: Linda Lai - A15540
Sent: Wednesday, February 12, 2020 3:06 PM
To: Patrick Lin - A20666 <Patrick.Lin@microchip.com>
Cc: Carol Jen - A21523 <Carol.Jen@microchip.com>; Casper Chang - A42964 <Casper.Chang@microchip.com>
Subject: SAM9X60 with UART x12

Hi Patrick,

請問我們有現成的"support embedded Linux, ethernet x1(Giga is better) and UART x12, RTS/CTS are not required" 在 SAM9X60嗎?

因為新需求必須在兩個月要做出來, Porting的速度會決定採用的Solution。

謝謝

Best Regards
Linda Lai

From: Hsiao.Johnny 蕭志堅 TAO <Hsiao.Johnny@inventec.com>
Sent: Wednesday, February 12, 2020 2:45 PM
To: Linda Lai - A15540 <Linda.Lai@microchip.com>; Carol Jen - A21523 <Carol.Jen@microchip.com>
Cc: Du.DavidTY 杜德一 TAO <Du.DavidTY@inventec.com>; Wu.JH 吳昭宏 TAO <Wu.JH@inventec.com>
Subject: RE: Need support for ATECC608A application

Hi Linda,

We need it support embedded Linux, ethernet x1(Giga is better) and UART x12, RTS/CTS are not required.

Best regards,

Inventec Corp.
886-3-3900000 #23678
Johnny Hsiao

From: Linda.Lai@microchip.com <Linda.Lai@microchip.com>
Sent: Wednesday, February 12, 2020 1:51 PM
To: Hsiao.Johnny 蕭志堅 TAO <Hsiao.Johnny@inventec.com>; Carol.Jen@microchip.com
Cc: Du.DavidTY 杜德一 TAO <Du.DavidTY@inventec.com>; Wu.JH 吳昭宏 TAO <Wu.JH@inventec.com>
Subject: RE: Need support for ATECC608A application

Hi Johnny,

除了12組UART　還需要什麼?
UART需要甚麼功能? 是否需要RTS, CTS等pin?

Best Regards
Linda Lai

From: Hsiao.Johnny 蕭志堅 TAO <Hsiao.Johnny@inventec.com>
Sent: Wednesday, February 12, 2020 12:56 PM
To: Linda Lai - A15540 <Linda.Lai@microchip.com>; Carol Jen - A21523 <Carol.Jen@microchip.com>
Cc: Du.DavidTY 杜德一 TAO <Du.DavidTY@inventec.com>; Wu.JH 吳昭宏 TAO <Wu.JH@inventec.com>
Subject: RE: Need support for ATECC608A application

Hi Linda,

MPU可以porting Linux, 你們有做好的kerenl、filesystem嗎? 因為新需求必須在兩個月要做出來, Porting的速度會決定採用的Solution。
http://ww1.microchip.com/downloads/en/DeviceDoc/SAM9X60-Data-Sheet-DS60001579A.pdf

Best regards,

Inventec Corp.
886-3-3900000 #23678
Johnny Hsiao

From: Linda.Lai@microchip.com <Linda.Lai@microchip.com>
Sent: Wednesday, February 12, 2020 12:03 PM
To: Hsiao.Johnny 蕭志堅 TAO <Hsiao.Johnny@inventec.com>; Carol.Jen@microchip.com
Cc: Du.DavidTY 杜德一 TAO <Du.DavidTY@inventec.com>
Subject: RE: Need support for ATECC608A application

Hi Johnny,

    MPU 才有 (13組)

    但MCU 有6~8 個UART，可以考慮用2個MCU 做
成本較低

Best Regards
Linda Lai

From: Hsiao.Johnny 蕭志堅 TAO <Hsiao.Johnny@inventec.com>
Sent: Wednesday, February 12, 2020 11:52 AM
To: Carol Jen - A21523 <Carol.Jen@microchip.com>; Linda Lai - A15540 <Linda.Lai@microchip.com>
Cc: Du.DavidTY 杜德一 TAO <Du.DavidTY@inventec.com>
Subject: RE: Need support for ATECC608A application

EXTERNAL EMAIL: Do not click links or open attachments unless you know the content is safe

Hi Carol,

Do you have 12 UART solution with your MCU or SoC?

Best regards,

Inventec Corp.
886-3-3900000 #23678
Johnny Hsiao

From: Carol.Jen@microchip.com <Carol.Jen@microchip.com>
Sent: Friday, December 27, 2019 9:15 AM
To: Linda.Lai@microchip.com; Hsiao.Johnny 蕭志堅 TAO <Hsiao.Johnny@inventec.com>
Cc: Du.DavidTY 杜德一 TAO <Du.DavidTY@inventec.com>
Subject: Re: Need support for ATECC608A application

Dear Johnny:
The project is as below?

    End customer: AWS
    Project Name: ZT: Andromeda
    Application: Server: Network Storage

Thanks. Carol.

Dream, Development, Deliver!

Carol Jen 任郁萱
TEL: +886-2-25088613
Mobile: +886-911077270
MVPN: 57049
Address: 12F, No.4, Sec. 3, Minchuan E. Road Taipei, 104, Taiwan, R.O.C.

寄件者: Linda Lai - A15540 <Linda.Lai@microchip.com>
日期: 2019年12月23日 星期一 上午11:10
收件者: Johnny Hsiao <Hsiao.Johnny@inventec.com>, Carol Jen - A21523 <Carol.Jen@microchip.com>
副本: "Du.DavidTY 杜德一 TAO" <Du.DavidTY@inventec.com>
主旨: RE: Need support for ATECC608A application

Hi Johnny,

    We have lib.
    See : https://www.microchip.com/wwwproducts/en/ATECC608A
    Looking "Development Environment" → Software Libraries → CryptoAuthLib

Best Regards
Linda Lai

From: Hsiao.Johnny 蕭志堅 TAO <Hsiao.Johnny@inventec.com>
Sent: Friday, December 20, 2019 10:20 AM
To: Carol Jen - A21523 <Carol.Jen@microchip.com>
Cc: Du.DavidTY 杜德一 TAO <Du.DavidTY@inventec.com>; Linda Lai - A15540 <Linda.Lai@microchip.com>
Subject: RE: Need support for ATECC608A application

EXTERNAL EMAIL: Do not click links or open attachments unless you know the content is safe

Hi Carol,

It is chosen by end customer.

Hi Linda,

I knew that is I2C interface, but I would like to know how to implement the interface easily on embedded Linux.

Does device driver included in Linux kernel? Which version?
Does any sample code or library in user space for using the device?

Best regards,

Inventec Corp.
886-3-3900000 #23678
Johnny Hsiao

From: Carol.Jen@microchip.com <Carol.Jen@microchip.com>
Sent: Friday, December 20, 2019 9:37 AM
To: Hsiao.Johnny 蕭志堅 TAO <Hsiao.Johnny@inventec.com>
Cc: Du.DavidTY 杜德一 TAO <Du.DavidTY@inventec.com>; Linda.Lai@microchip.com
Subject: Re: Need support for ATECC608A application

Dear Johnny:
Let me add Linda for you first.
 And, may I know the end customer? you choose the solution?

Kindly access the website to get the information; then we can discuss how to support. OEM and ODM will be different for service.
https://www.microchip.com/wwwproducts/en/ATECC608A

Thanks. Carol.

Dream, Development, Deliver!

Carol Jen 任郁萱
TEL: +886-2-25088613
Mobile: +886-911077270
MVPN: 57049
Address: 12F, No.4, Sec. 3, Minchuan E. Road Taipei, 104, Taiwan, R.O.C.

寄件者: Johnny Hsiao <Hsiao.Johnny@inventec.com>
日期: 2019年12月19日 星期四 下午3:24
收件者: Carol Jen - A21523 <Carol.Jen@microchip.com>
副本: "Du.DavidTY 杜德一 TAO" <Du.DavidTY@inventec.com>
主旨: Need support for ATECC608A application

EXTERNAL EMAIL: Do not click links or open attachments unless you know the content is safe

Hi Carol,

IEC will use Microchip Crypto Authentication Device, is ATECC608A, for enterprise computer application. Could I get a kit for pre-study?
Who can provide the technique support? Please give me he/her email and extension number.

Thank you.

Best regards,

Inventec Corp.
886-3-3900000 #23678
Johnny Hsiao